CANADIAN MACHINERY
AND MANUFACTURING NEWS

A weekly newspaper covering in a practical manner the mechanical power, foundry and allied fields.
Published by the MacLean Publishing Company, Limited, Toronto, Canada.

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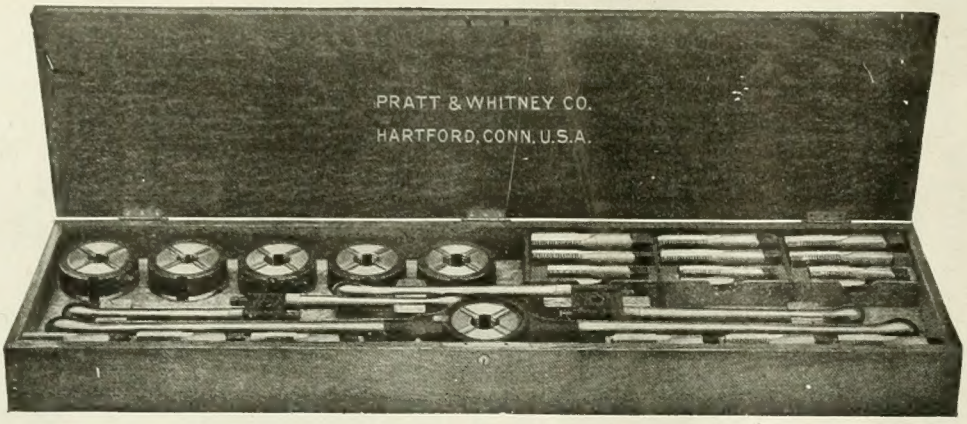
Just take this letter to

THE CLEVELAND TWIST DRILL CO. · CLEVELAND · NEW YORK · CHICAGO

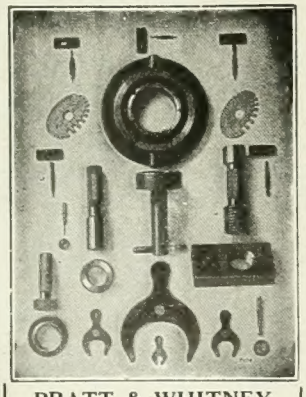
Agents for Europe, CLEVELAND TWIST DRILL CO., (GREAT BRITAIN) Ltd., 36-37 Upper Thames St., London E. C. 4.

SMALL TOOLS



P. & W. Die-Stock Set No. 4

These sets are furnished in various capacities for either U.S. Standard, S.A.E. Standard, Whitworth Standard or "V" Form. The Pratt & Whitney Policy of highest quality materials, together with the necessary refinement and accuracy, is maintained in all tools composing these sets.



PRATT & WHITNEY
Standards and Gauges
Accuracy Unequalled

PROMPT SERVICE

is assured at our nearest store where P. & W. Small Tools are carried in stock. Place your order there to-day.

PRATT & WHITNEY CO.

OF CANADA, LIMITED

Works: DUNDAS, ONTARIO

MONTREAL	TORONTO	WINNIPEG	VANCOUVER
723 Drummond Bldg.	1002 C.P.R. Bldg.	1205 McArthur Bldg.	B.C. Equipment Co.

BERTRAM
MACHINE TOOLS

42-inch Vertical Boring and Turning Mill

Motor driven through speed box. Built in sizes from 42-inch to 100-inch.

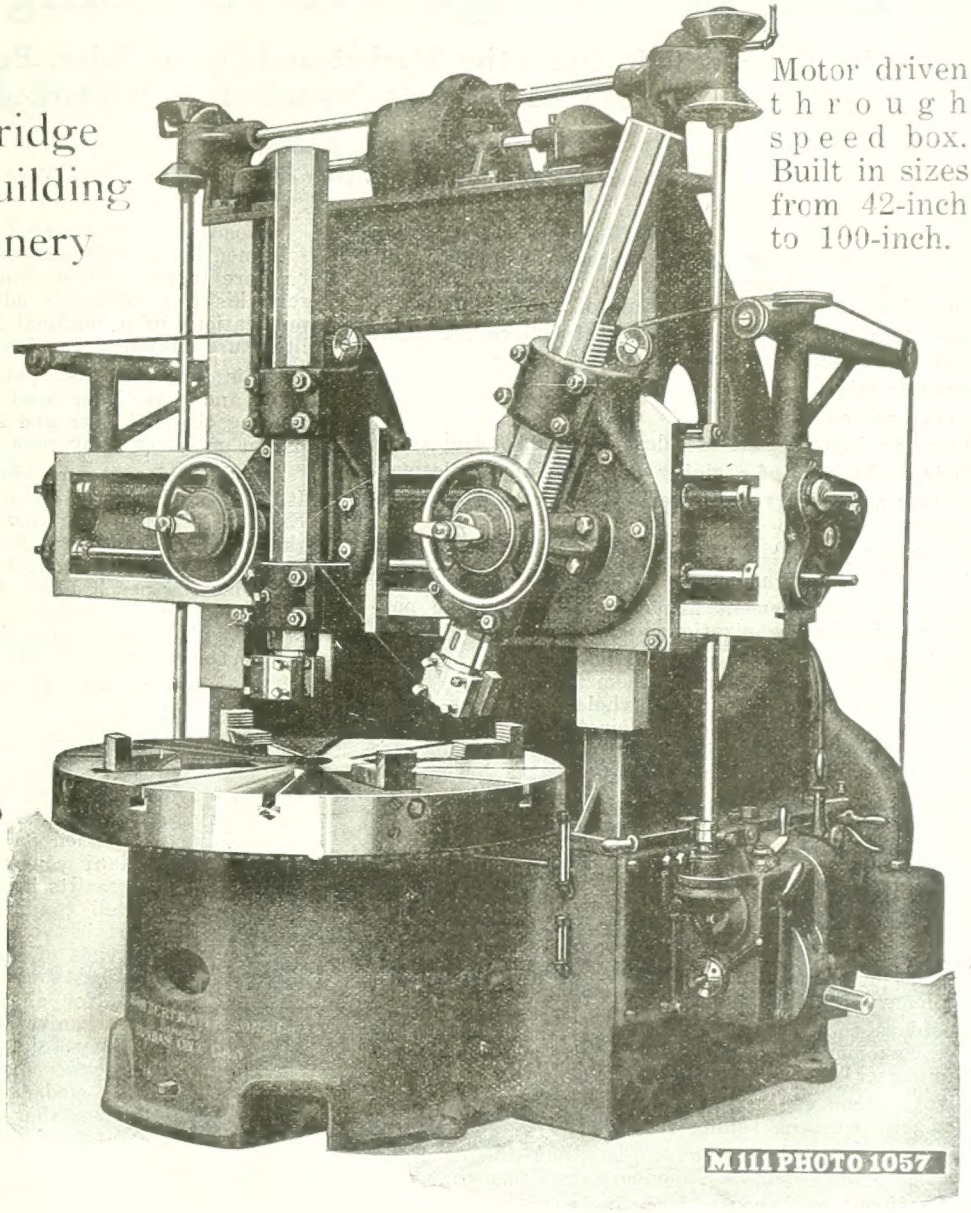
Structural Bridge Shop Shipbuilding Plant Machinery

Locomotive and Car Shop Equipment

Repair Shop Machinery

General Machine Shop Equipment

Drop us a line for Photographs and full particulars.



M 111 PHOTO 1057

The John Bertram & Sons Company Limited

DUNDAS, ONTARIO, CANADA

MONTREAL 723 Drummond Bldg. TORONTO 1002 C.P.R. Bldg. VANCOUVER 609 Bank of Ottawa Bldg. WINNIPEG 1205 McArthur Bldg.

The Publisher's Page

TORONTO APRIL 10, 1919

A List of Things Advertising Will Do*

Not Only Will It Open the Market and Speed Sales, But Its Effects on the Advertiser's Organization Is Marked

By W. S. Lockwood

Advertising Manager, H. W. Johns-Manville Co., New York

I NOTICE, on page 102 of your March 6 issue, a letter inquiring for a list of things that advertising will do. I think I have a fairly comprehensive list and I should like to come to the rescue of your inquirer.

Here is a list of the things that I believe the right kind of advertising will accomplish. It will—

Increase sales.

Lower selling costs.

Attract a better grade of salesmen to an organization.

Reduce the cost of training and obtaining salesmen.

Attract a better grade of general employees to an organization.

Assist the purchasing department in getting material.

Assist the traffic manager in moving the product.

Assist the employment manager in getting the particular people the organization needs.

Assist those responsible for the financing of a business not only rendering it easier for them to get money when needed, not only giving them the whole country as a field in which to seek accommodations instead of merely the city or district in which the concern is known, but also render it possible to finance a business at a lower cost.

Keep down competition. If a field is dominated by a highly successful national advertiser, there is far less danger of competition springing up.

Render salesmen more efficient.

Facilitate collections.

Protect a concern against the consequences of a revolutionary movement being made by a competitor. The right sort of advertising is business insurance against revolutionary improvements.

Enable a concern to reach all classes, to reach prospective customers that might never be reached by salesmen or direct by mail advertising.

Give a stronger control over the entire organization particularly over the selling force.

Cause more dealers who are handling the concern's product to spend their own money advertising that fact.

Advertising will cause individuals to accept more readily a concern's product when recommended by salesmen.

This is the well-known principle of consumer acceptance, but my list would not be complete without referring to it because it is most important.

Facilitate. the legitimate influencing of legislation where such influencing is desirable.

In the case of specialties, such as typewriters, adding machines, etc., advertising reduces the probability of a concern's machine being traded out for a competitive piece of apparatus.

Broad, general advertising usually renders a concern's salesmen better informed on its product than they would be were there no advertising. Somehow a salesman will read his own concern's advertising when it appears in publications of a national standing when he won't read literature prepared for his special instruction.

This is a long list, you will say. Perhaps you will smile and shake your head as did a friend of mine, after reading this list over and say sadly, "What a wonderful patent medicine copy man that fellow would make!"

Well, it does sound kind of all-inclusive, doesn't it? It does sound like the claims for Dr. Ketchem's Renowned Exhilarator, "good for man or beast, guaranteed to cure rheumatism, gout, hay fever, tuberculosis, falling hair and an indisposition to get up in the morning. Splendid for removing peach stains from clothing and unsurpassed for polishing the piano. A few drops on the shaving brush will improve your lather wonderfully. Makes a wonderful sauce for roast goose."

Will Stimulate All Functions of a Business

Yes, it does look a little bit like the same sort of extravagant claiming of everything, that we used to find in the patent medicine ads, but here is the difference—modern advertising is not merely a temporary stimulant for a certain portion of a business. it is much more. Advertising as carried on in days gone by and as still carried on by many concerns, is, of course, merely that and nothing more. Its sole purpose is to promote sales. Sometimes, if well conducted, it actually does that, as in the case of certain types of retail advertising, as in the case of certain types of mail-order advertising. But the broad, modern advertising of which I am speaking is a stimulating force for an entire organization, for every member of that organization. It is a business tonic and the difference between the claims I have made for it and the claims of the quack medicine fakirs is that they used to claim that their medicine would actually do everything and I merely affirm that advertising will stimulate all the various functions of a business.

My list may not be complete. If I have overlooked anything I shall be grateful to any reader of *Printers' Ink* who will furnish me with one or more additional items. It seems to me that the suggestion of your correspondent is an excellent one and that it is high time that somebody took upon himself the responsibility of compiling a complete list of the things that modern advertising will do for a progressive organization.

Yes, there is one thing more. Advertising stimulates the central organization in a peculiar and remarkable way. All the members of it somehow realize that they have got to get back of their advertising and "make it succeed." Even the boss works harder where a concern is advertising extensively, but he gets a lot more fun out of it.

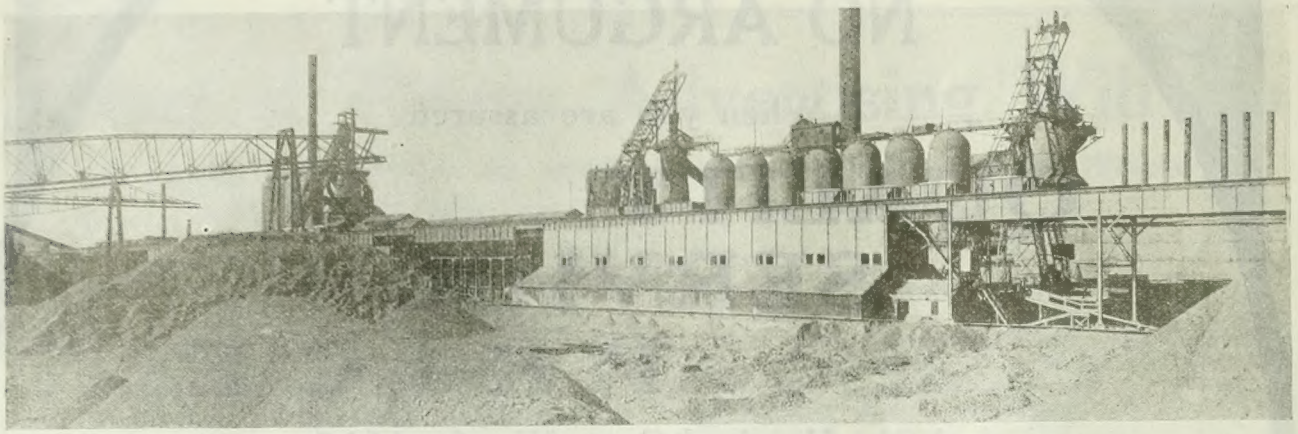
(**Extract from an article in Printer's Ink*)

Canadian Machinery and Manufacturing News, April 10th, 1919. Vol. 21, No. 15. Published weekly at 143-153 University Ave., Toronto, Canada. Subscription price in Canada, $3.00; in United States, $3.50. Entered as second class matter at the Post Office Department, Ottawa, Canada. Entered as second-class matter July 1, 1912, at the Post Office at Buffalo, under the Act of March 3rd, 1879.

Quality
Service
THERE IS
NO ARGUMENT
When you are assured
QUALITY
SERVICE
PRICE
and One Hundred Cents Worth of Value
for Every Dollar You Spend
PURCHASE THE PRODUCTS
OF
CANADIAN MILLS
A Canadian Dollar is Worth One Hundred Cents in Canada
THE
STEEL COMPANY
OF
CANADA
LIMITED
HAMILTON MONTREAL

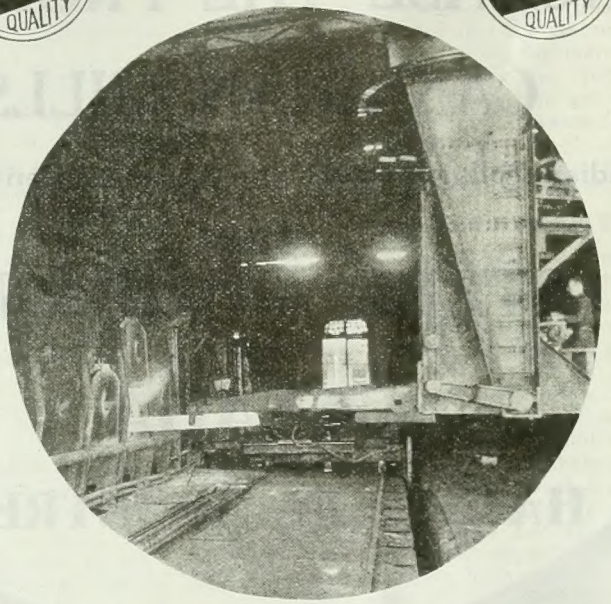
ALGOMA STEEL CORPORATION, LTD.

SAULT STE. MARIE, ONTARIO



BLOOMS,
BILLETS,
SLABS,
STRUCTURAL
STEEL
MERCHANT
BARS
CONCRETE
REINFORCING
BARS
IRON, BRASS
AND BRONZE
CASTINGS

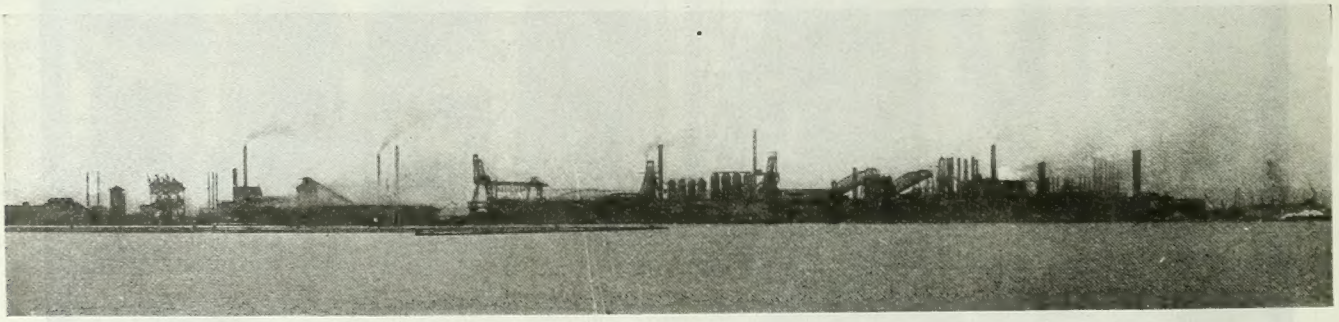
MARK OF ALGOMA O.H. QUALITY



Charging and Withdrawing Crane

Sulphuric Acid. Nitre Cake

STEEL
RAILS
Open Hearth Quality
(All Sections from 12 lbs
to 100 lbs per yard)
SPLICE
BARS
STEEL
TIE PLATES
PIG IRON
BASIC, FOUNDRY-
BESSEMER
SULPHATE OF
AMMONIA



GENERAL VIEW OF THE PLANT OF THE ALGOMA STEEL CORPORATION FROM THE WATERFRONT

BETTS

Heavy Duty Machine Tools

enjoy an enviable reputation for simplicity of design, durability, rigidity and accuracy. This is the result of fifty-eight years of concentrated effort to produce the best tools that mechanical genius can devise.

Betts heavy duty machine tools have kept pace with the demand for increased production and are to be found in practically all of the leading locomotive works, railroad shops, steel mills, shipyards, forge shops, navy yards, electrical shops, rubber factories, etc.

The machine illustrated below is a 20-foot boring mill. A general idea of its massiveness may be gleaned from the fact that there are 75 men standing or seated on its structure, and it weighs 374,000 lbs. This machine is as uniformly accurate as the 5-foot and increasingly larger sizes.

Our entire organization is at your service. Send for detailed specifications, quotation, and delivery on any Betts tool.

HEAVY BETTS DUTY

Planers

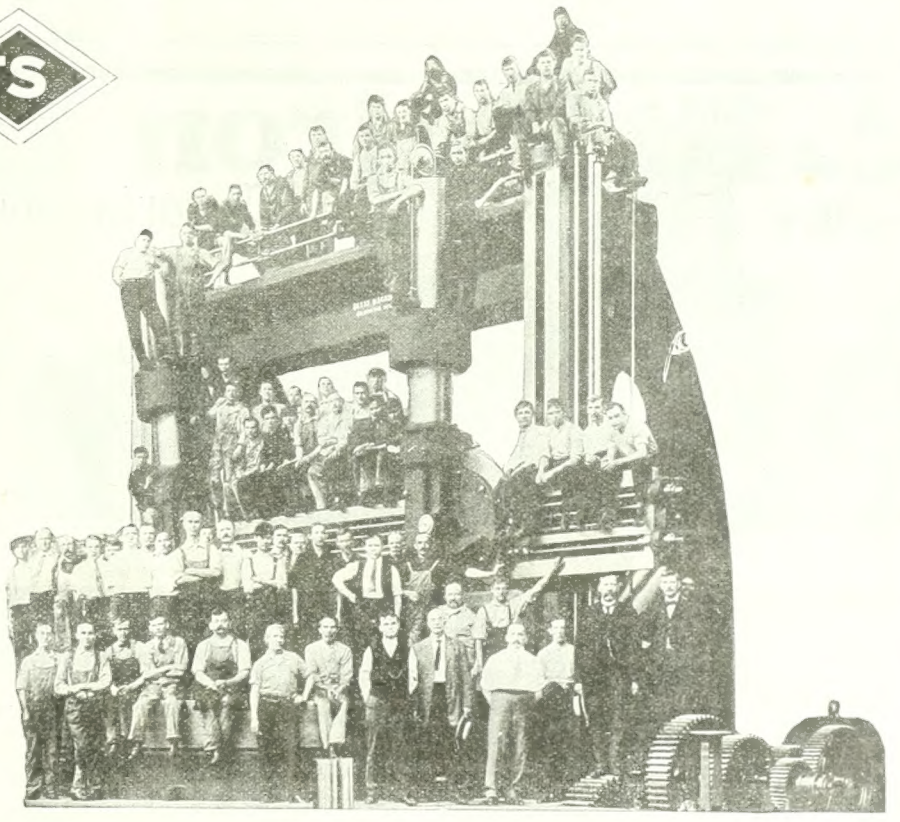
Boring and Turning Mills

Horizontal Boring, Drilling and Milling Machines

Tire Turning Mills

Car Wheel Borers

Crank Slotters

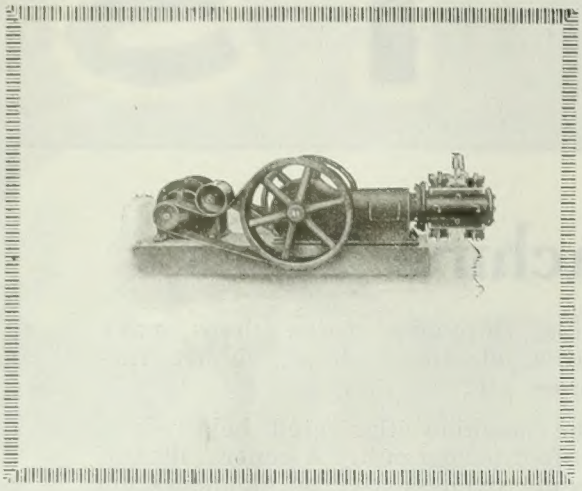


BETTS MACHINE CO.

408 Blossom Rd. Rochester, N.Y.

Formerly of WILMINGTON. DEL.

The Short Belt Drive For Compressors Saves Space



Have you been wondering how you can fit that compressor into your power house? Here is the solution—the short-belt drive.

We build both single-stage and two-stage machines—straight-line and duplex with this type of drive.

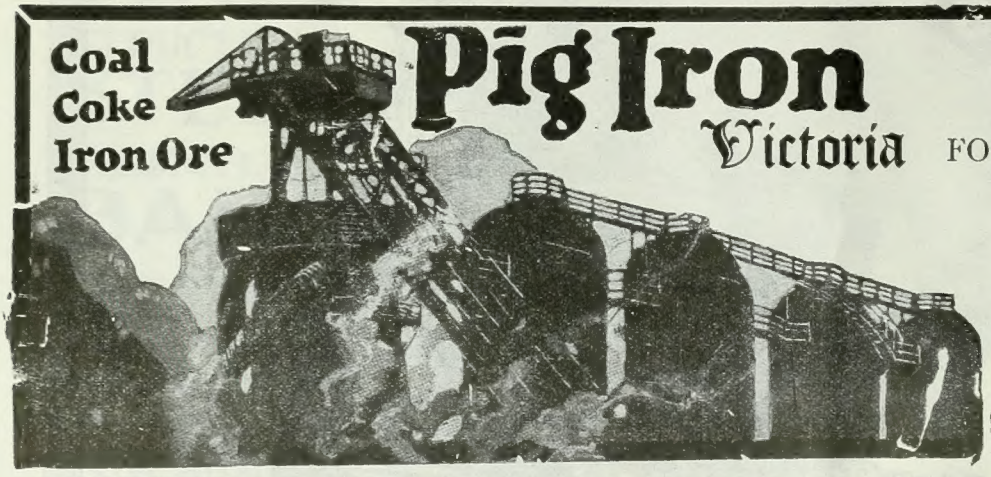
Less floor space
Less belt expense
No belt stretching
Capacities up to 2,000 ft. per min. with short-belt drive.

Send for our booklet on how to apply the short-belt drive to the best advantage.

Canadian Ingersoll-Rand Company Limited

SYDNEY, SHERBROOKE, MONTREAL, TORONTO
COBALT, WINNIPEG, NELSON, VANCOUVER

Coal
Coke
Iron Ore



Pig Iron

Victoria FOUNDRY & MALLEABLE

Made by The Canadian Furnace Co.
Port Colborne, Ontario, Canada

M. A. HANNA & Co.

Sales Agents, CLEVELAND

Canadian Office:
904 C.P.R. Bldg., Toronto

FIRTH'S Speedicut HIGH SPEED Steel

Insures Maximum Production

FIRTH'S CARBON TOOL STEELS
Standard Brands Highest Quality

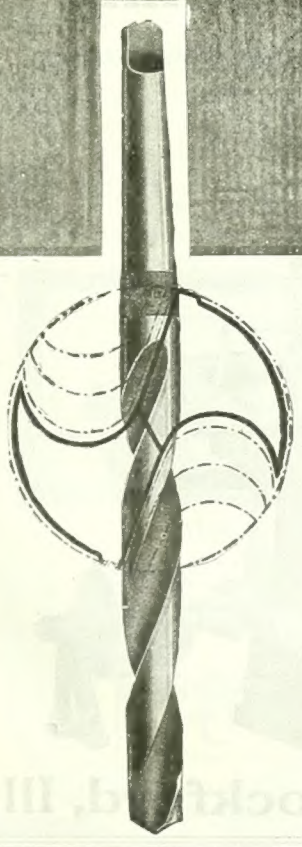
THOS. FIRTH & SONS, Limited, Sheffield, England

CANADIAN WAREHOUSES | 449 St. Paul St. West, MONTREAL
79 West Adelaide St., TORONTO

J. A. SHERWOOD
Canadian Manager

WILT

HIGH SPEED AND CARBON TWIST DRILLS, REAMERS AND MILLING CUTTERS



Quality Tools a Vital Necessity

Where there's a WILT--There's the Way

Equip your plant with modern tools of the best quality. It is the vital necessity of the day to manufacturers. Competition of the present and in the future demands it.

For your drilling, reaming and milling cutter operations, choose *WILT High Speed and Carbon Drills, Reamers and Milling Cutters.* As compared with any ordinary tool they cut faster, more accurately, require less power, require less re-grinding and give longer service—and they cost no more than ordinary tools.

Put them to the test—you'll find them best.

Wilt Twist Drill Company
OF CANADA, LIMITED

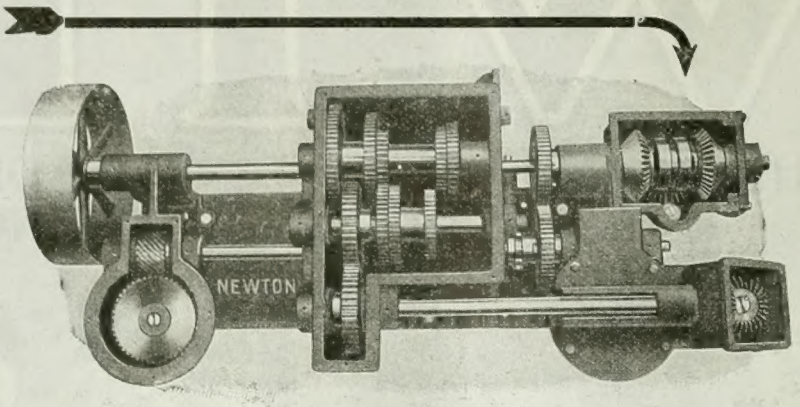
Walkerville **Ontario**

London Office: Wilt Twist Drill Agency, Moorgate Hall, Finsbury Pavement, London, E.C. 2, England.

THE JOHNSON FRICTION CLUTCH

OVER THERE

is incorporated in a nest of gears and controls the rail elevating on a NEWTON Four Spindle Milling Machine.



Courtesy of Newton Machine Tool Works, Philadelphia, Pa.

YOU SHOULD

incorporate clutches in your machine. Bear in mind that there is a JOHNSON FRICTION CLUTCH for every requirement. Follow our ads., note the machine tool builders who have adopted JOHNSON FRICTION CLUTCHES. Send us a blue print showing where you desire to use a clutch. We will then show you just what we would supply. This is a part of JOHNSON SERVICE. What are you requirements?

Our Booklet "Clutches as Applied in Machine Building" and Yellow Data Sheets are Free

AGENTS: CANADA—Williams & Wilson, 320 St. James St., Montreal. The Canadian Fairbanks-Morse Co., Ltd., Montreal and Branches. ENGLAND—The Efandem Co., Ltd., 22 Newman St., Oxford St., London, W. 1, Sole Agents for British Isles. AUSTRALIA—Edwin Wood Pty., Hdwe. Chambers, 231 Elizabeth Street, Melbourne, Victoria. JAPAN—Andrews & George Co., 16 Takegawacho, Kiobashiku, Tokyo. SOUTH AFRICA—D. Drury & Co., Main St., Johannesburg. FRANCE—Anciens Etab. Glaenzer & Perreaud, 18 Faubourg du Temple, Paris.

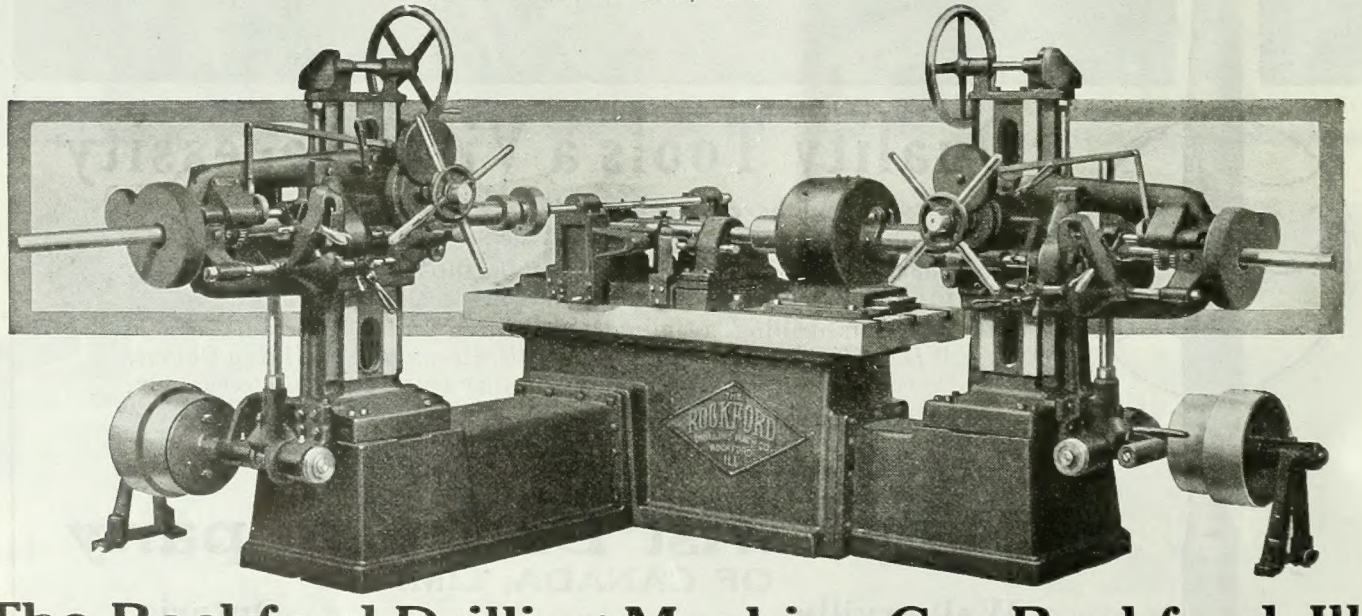
THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN.

Rockford Horizontal Boring Machine

For Automobile Manufacture

This tool is unusually rapid and accurate in the boring of crank cases, transmission cases and rear axles. Has two heads at right angles to each other. Spindles bore longitudinal and cross holes in work simultaneously.

Send us blue prints of your boring work and we will give you figures on the "Rockford's" ability on it.



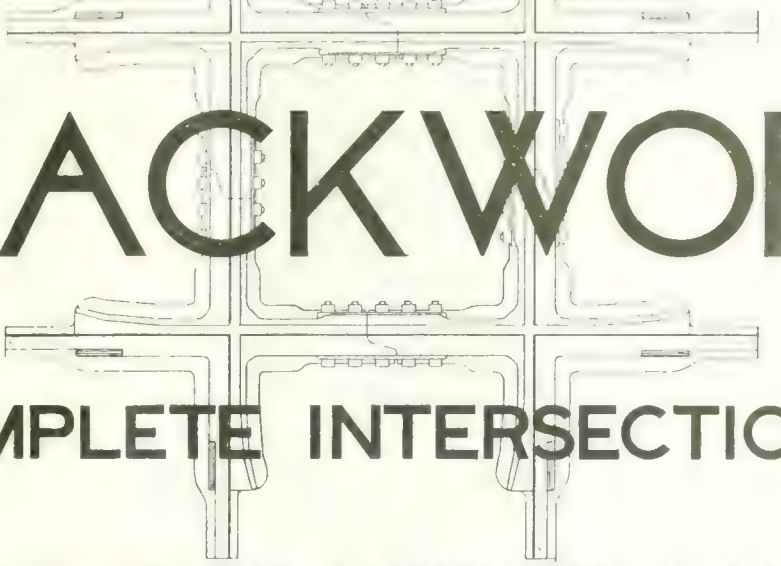
The Rockford Drilling Machine Co., Rockford, Ill.

Frogs, Switches
Mates, Crosses
Diamonds, Etc.

For Steam & Electric Railways

Built-up, Hard-Centre or Solid Manganese-Steel

TRACKWORK



COMPLETE INTERSECTIONS

CANADIAN STEEL FOUNDRIES, LIMITED

Transportation Building, Montreal

Electrite

Electric furnaces, automatically regulated, the most modern methods, and the introduction of **Uranium** — make this a steel of truly remarkable cutting properties.

We know "Electrite" cannot be bettered — and stand ready to prove it to you.

LATROBE ELECTRIC STEEL CO.
LATROBE, PA.

High Speed Steel

Uranium

Forging Billets and Bars

Electric Furnace, Alloy Steels

Die Blocks

Annealed—Heat Treated

Piston Rods

Rough Turned—Annealed—Heat Treated

High Speed Steel

General Steel Company

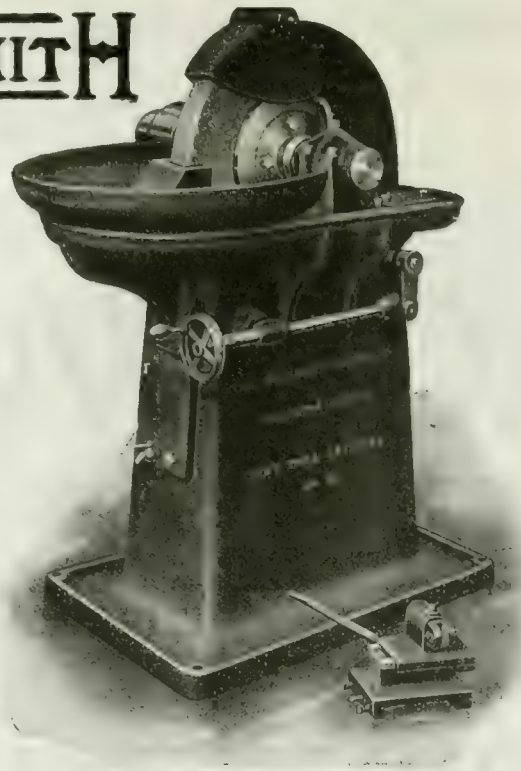
Milwaukee, Wisconsin

DETROIT—823 Dime Bank Building

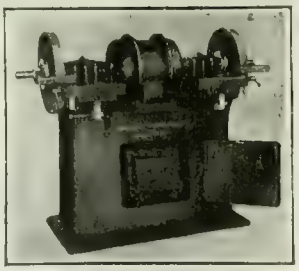
FORD-SMITH Grinders

A fine example of high grade material and workmanship

General Purpose Grinder



Water Tool Grinder



Motor Driven Floor Grinder

Motor-Driven Grinders
Floor Grinders
Bench Grinders
Water Tool Grinders
Swing Grinders
Disc Grinders
Special Grinding Machinery
Hack Saws
Swivel Tables

Write for Catalogue and price list.

The Ford-Smith Machine Co., Ltd.
HAMILTON - ONTARIO

FOREIGN AGENTS:
W. E. Storey, 3 Arundel St., London, Eng. Alf. Herbert, Limited, 54 Dey St., New York, U.S.A.

IMPERIAL GENUINE BABBITT METAL

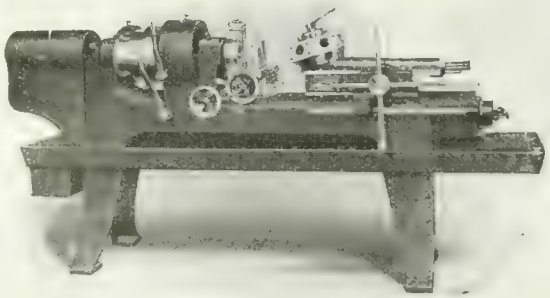
The Highest Grade Manufactured

Made specially for all HIGH SPEED, HEAVY ENGINES and EXTRAORDINARY HARD WORK

Manufactured and guaranteed to give excellent service by
THE CANADA METAL COMPANY, Limited, FRASER AVENUE TORONTO, Hamilton, Montreal Winnipeg, Vancouver

THE TILTED TURRET

A CLEAR TRACK FOR THE STOCK



INVESTIGATE!

SEND FOR
CATALOG "C"
OR
ASK THE USER

WOOD TURRET MACHINE CO.
BRAZIL INDIANA U.S.A.

STELLITE

"Not Steel but its Master"

PROPER PROCEDURE + STELLITE = PRODUCTION AND ECONOMY

One of Toronto's new industries was presented by us with a Tool-Holder Bit of No. 3 STELLITE to try out on Cast Iron.

They made tests with the best brands of High Speed Steel as against STELLITE, and found that they were able to run at double the speed and feed by using STELLITE.

"AS A MATTER OF FACT A TOOL BIT OF ⅜-inch square STELLITE HAS TURNED OFF 35,000 TIMES ITS OWN WEIGHT OF CAST IRON IN TEN DAYS."

As a consequence of their own tests they laid out their transmission to accommodate STELLITE and are now getting a much larger production than they had estimated.

We visited them recently and warned the Superintendent to save his shop-ends of STELLITE, as they were worth $2.00 per pound to his firm.

This was like getting money from home, as he had already decided to use STELLITE without this added incentive.

ASK FOR DEMONSTRATION.

Deloro Smelting & Refining Company, Limited

TORONTO
200 King Street West

H.O. and WORKS: DELORO, ONT.

MONTREAL
315 Craig Street West

MEN whose souls have been tried in the Crucible of War Time Service will not easily forget those forces, either Human or Mechanical, which were instrumental in achieving Victory.

"Red Cut Superior"

The Nationally Known FIRST QUALITY

HIGH SPEED STEEL

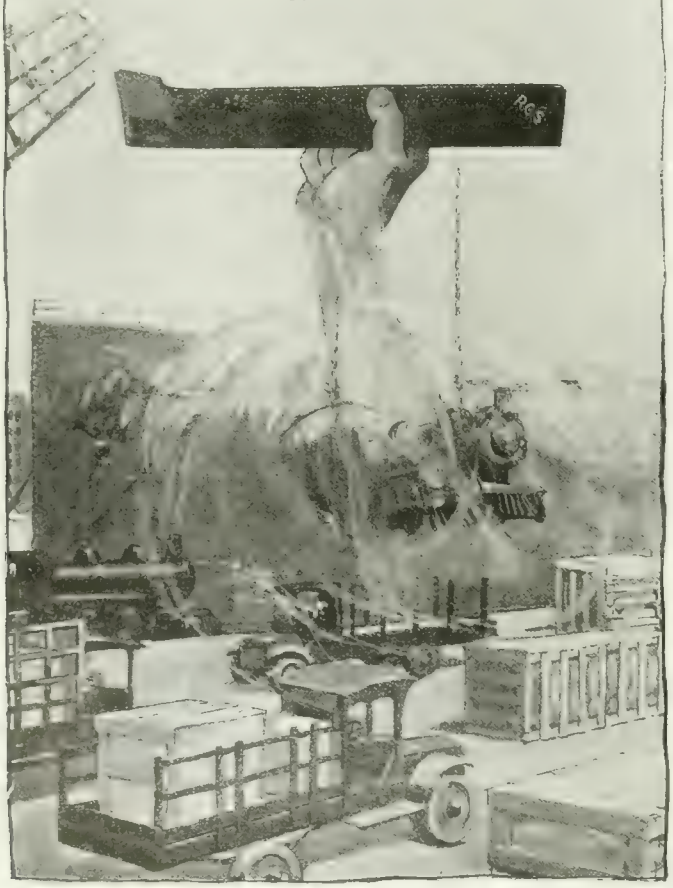
Is a Fighter for Efficiency in Peace Times and War Times.

Are your Tools made of "Red Cut"?

VANADIUM-ALLOYS STEEL CO.

General Sales Offices, PITTSBURGH, PA.
Works, LATROBE, PA.

BOSTON
BUFFALO
CINCINNATI
CHICAGO
CLEVELAND
DETROIT
PITTSBURGH
MONTREAL
NEW YORK
TORONTO



WOLFRAM
MADE IN THE U.S.A.
HIGH SPEED STEEL
TRADE MARK

A Keen Cutter

WOLFRAM *Is Both*

VULCAN CRUCIBLE STEEL CO.
ESTABLISHED 1900
Aliquippa Pa: U.S.A.
Represented in Canada by Messrs. Norton Callard & Company, Montreal Que.

Strong in the Neck

Swedish Steel & Importing Co., Limited

Montreal
New York
Toronto
Denver

Direct representatives of foremost Swedish mills: makers of

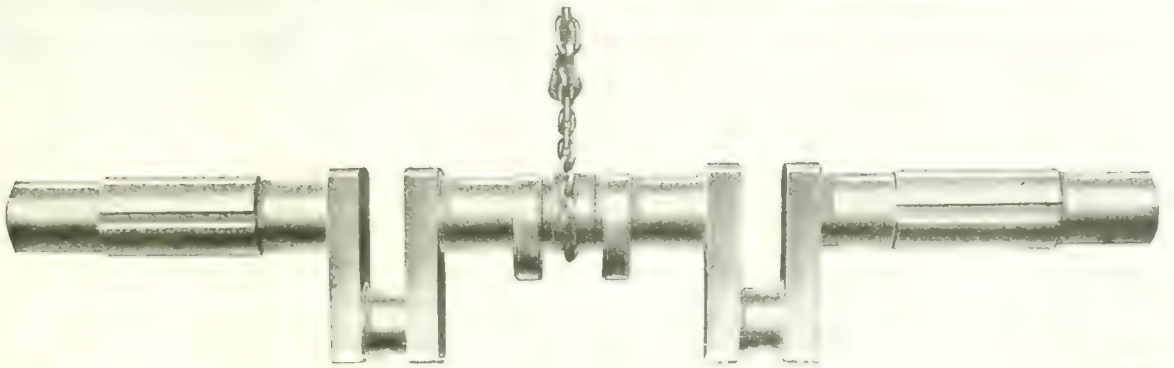
Tool Steels

ALLOY STEELS, BILLETS, BARS, DISCS, SHEETS, HIGH SPEED STEELS, DRILL RODS, DRAWN BARS, SEAMLESS TUBING, COLD ROLLED STRIP STEEL, WELDING WIRE, WROUGHT AND ROLLED IRON, PIG IRON, STEEL AND IRON ENDS, HOLLOW AND SOLID MINING DRILL STEEL.

TRADE MARK
SS
DOUBLE ESS

PROMPT SHIPMENTS from large stock

CANADA FOUNDRIES & FORGINGS LIMITED



Why Worry? Bring It To Us If It Is a Forging.

Canadian Billing & Spencer Plant

Welland

LOCOMOTIVE AND CAR WHEEL TYRES

HIGH-SPEED AND CARBON
TOOL STEEL

MISCELLANEOUS SHOP TOOLS

MADE IN CANADA

ARMSTRONG WHITWORTH
OF CANADA, LIMITED

Head Office:
298-300 St. James Street,
Montreal.

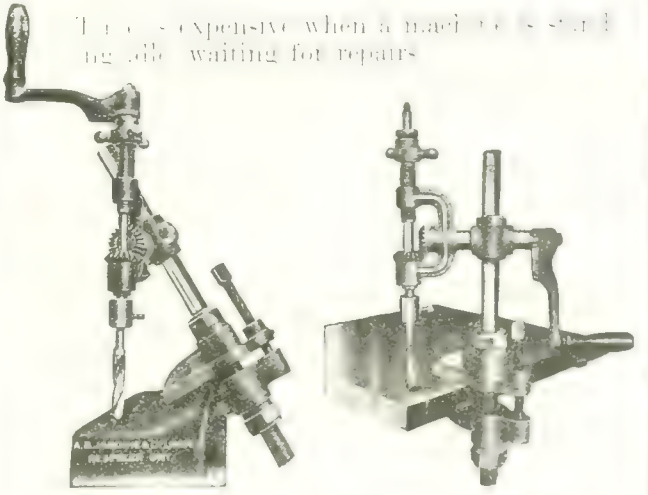
Works:
Longueuil, Que.

Branches:

126 Wellington St. E. TORONTO
27 King William St. HAMILTON
McArthur Building WINNIPEG

Jardine Universal Ratchet Drill

[illegible] expensive when a machine is [illegible] ing job waiting for repairs



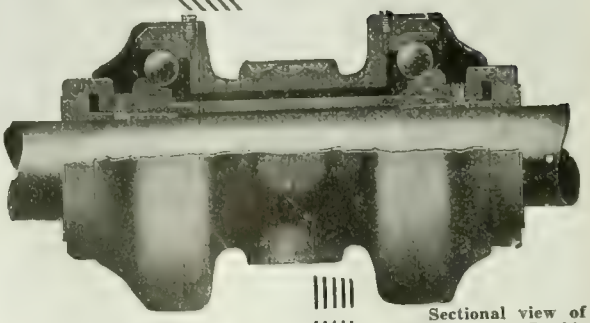
On the average repair job, this machine completes the drilling in less than the time required to set an ordinary ratchet to begin.

Weight, 10 lbs. Price, $26.50 net

Sold by all Machinery and Supply Houses

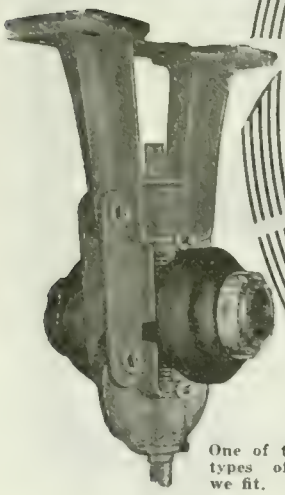
A. B. JARDINE & CO., Limited
HESPELER, ONTARIO

Chapman Double Ball Bearings



Sectional view of Chapman Double row ball bearings.

Pay You to Adopt Them



One of the many types of frames we fit.

Are you using babbitted bearings in your power transmission machinery? The power you are losing through friction by their use would in two years' time pay for an installation of **Chapman** type of Ball Bearings. This is a fact proven by their installation in over 3,000 plants in Canada and United States.

Chapman Double Ball Bearings practically eliminate friction, and they require lubrication only once or twice a year—therein lies the secret of their ecenomy.

Chapman Double Ball Bearing Company of Canada, Limited

339-351 SORAUREN AVE., TORONTO
Room 408 Shaughnessy Bldg., Montreal; Transmission Ball Bearing Co., Inc., 1050 Military Rd., Buffalo, N.Y.

Have you received a copy of Catalog 3-G? Pay to send for one if you haven't.

E S & M

ELECTRIC

Steel Castings

High Grade STEEL Castings Of Every Description

Prompt Deliveries

Send us your drawings for estimates.

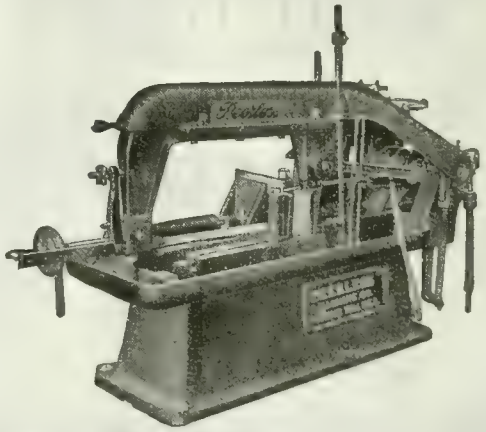
THE ELECTRIC STEEL AND METALS COMPANY, LIMITED

WELLAND ONTARIO

Peerless HIGH SPEED

THE NEW STANDARD

Increases Production—50 to 100%



It increases production 50 to 100 per cent. with the same number of machines, at a greatly reduced cost.

Or it gives the same production with two-thirds to one-half as many machines, saving in investment, in attendance and in floor space. And in all cases it saves in expensive material and saw blades.

Proof can be furnished in the record the Peerless High Speed has made with many large concerns of international reputation. Further proof and the best proof will be to try it in your own shop; and if you think you can afford to do without it after 30 days' use, we will pay freight both ways.

Write for description, names of users and trial plan.

PEERLESS MACHINE CO.

1607 RACINE STREET RACINE, WISCONSIN

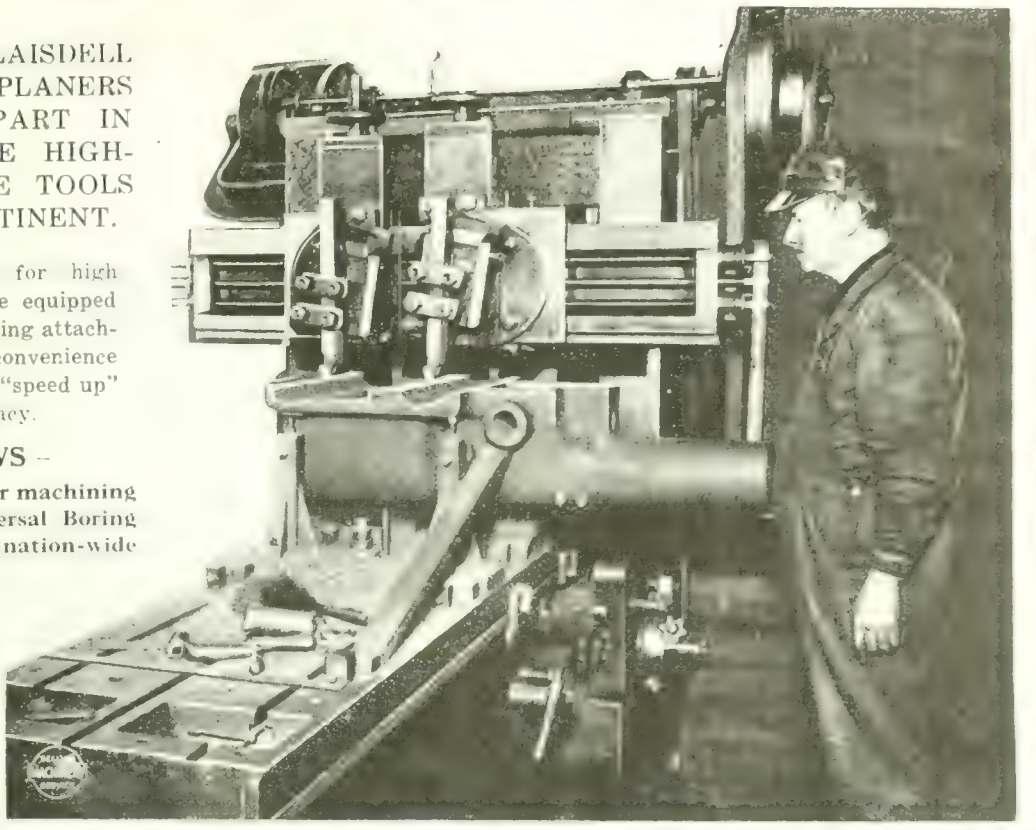
Whitcomb-Blaisdell Planers

WHITCOMB-BLAISDELL LATHES AND PLANERS PLAY SOME PART IN THE MOST OF THE HIGH-GRADE MACHINE TOOLS MADE ON THE CONTINENT.

ALL-round machines for high grade work, they are equipped with special labor-saving attachments that add to their convenience and enable the operator to "speed up" without endangering accuracy.

ILLUSTRATION SHOWS –

a Whitcomb-Blaisdell Planer machining the head post of a Universal Boring Machine a machine with a nation-wide reputation for accuracy.



May we send you our catalogue giving full particulars?

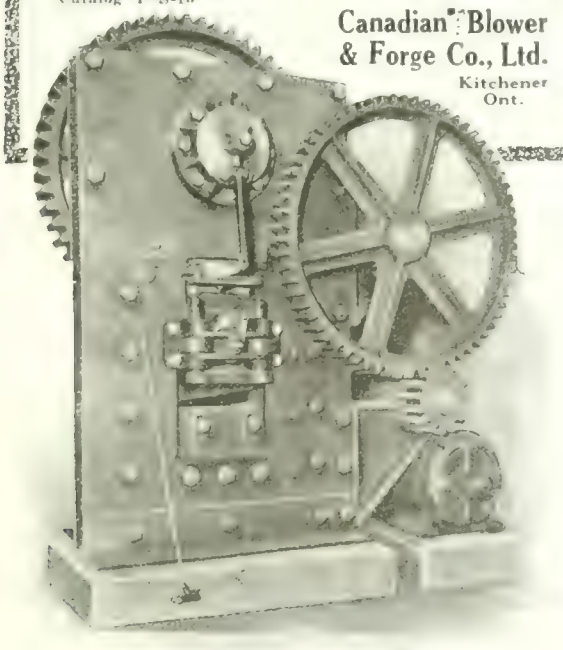
Whitcomb-Blaisdell Machine Tool Co.,
WORCESTER, MASS.
U. S. A.

CANADIAN ARMOR PLATE

PUNCHES, SLITTING SHEARS, and BAR CUTTERS are dependable. They are built of "Armor Plate" steel—tensile strength 75000 lbs. per square inch—7½ times as strong as cast iron.

That means a lighter and stronger machine - a machine built to take a lot of punishment. Write for Catalog P S-16

Canadian Blower & Forge Co., Ltd.
Kitchener Ont.



GENUINE EMERY

Sizes 180, 160, 140, 120, 110, 100, 90, 80, 70, 60, 54, 46 40, 36, 30, 24, 20, 18, 16, 14, 12, 10, 9, 8. hole.

EMERY FLOUR AND WASHED FLOUR

EMERY GLASS FLINT GARNET CORUNDUM CARBORUNDUM	PAPER AND CLOTH	IN SHEETS, ROLLS, DISCS, BANDS, STRIPS and TAPES, &c.

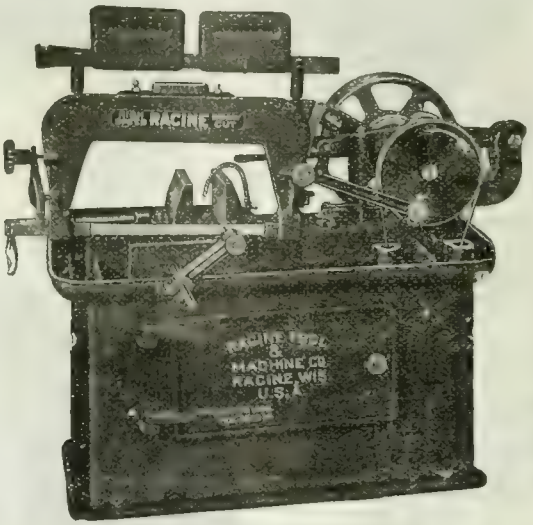
John Oakey & Sons

LIMITED
WELLINGTON MILLS
LONDON, S. E. 1., ENGLAND

USE

THE "RACINE"

FOR HIGH SPEED METAL CUTTING



The "RACINE" is capable of making straight, clean cuts at high speed through angle irons, die-blocks, heavy bars, etc. It combines the advantages of fast work with **least blade wear.**
Our patented automatic lifting device raises the blade on the non-cutting stroke, thus prolonging the cutting life of the blade by eliminating all undue pressure and drag.
Have us prove our claims. Write for details to-day.

Use "RACINE" H.S. Tungsten Blades

Racine Tool & Machine Company

Melbourne Ave., Racine, Wis., U.S.A.

STANDARD THE WORLD OVER

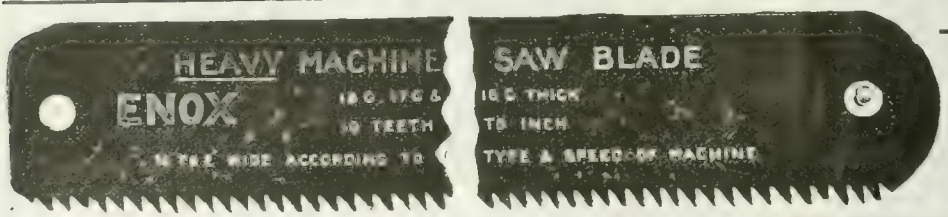
SIMONDS

HACK SAW BLADES

UNEQUALED IN QUALITY ANY SIZE OR LENGTH

Simonds Canada Saw Co. Limited

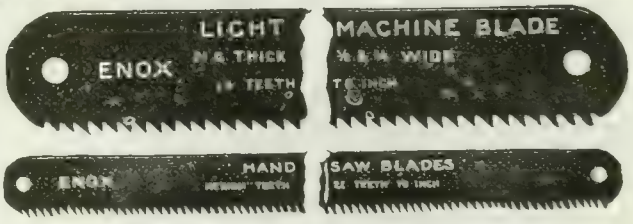
ST. JOHN MONTREAL VANCOUVER



ENOX

Hacksaw Blades

ARE THE BEST



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Liberal Terms offered to firms willing to carry stocks and act as sole agents for the district.

Makers:

Y'S (LONDON) LIMITED

AN ENTIRELY BRITISH COMPANY

per Thames St., London, E.C. 4, England. Works: Greenwich, S.E. 10

Agents for Canada, East of Fort William:

THE STANDARD MACHINERY & SUPPLIES, LIMITED, 261 Notre Dame St. West, MONTREAL, QUE.

Agents for British Columbia—The A. R. Williams Machinery Co., Limited, 495 Railway St., Vancouver, B.C.

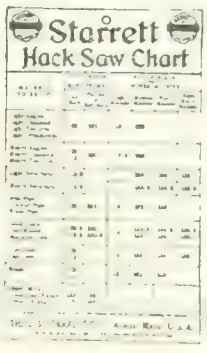
Different Metals Require Different Hack Saw Blades

If you want to cut structural steel or brass pipe efficiently, you need a different hack saw than for cast iron or machine steel, and you certainly can't work as coarse a blade in a light machine as in a heavy one. To try to do everything with the same blade is simply to do most of it inefficiently.

Starrett Hack Saws

do the most work with the least effort and in the shortest time because each one is made to meet the exact requirements of different metals in different powered machines.

Our Hack Saw Chart will help you select the proper blade for any kind of work, and you can depend upon it. Our Service Department will help you solve your cutting problems and increase the efficiency of your cutting-off department.



Write us today. Ask for Catalog No. 213

THE L. S. STARRETT CO.

The World's Greatest Toolmakers
Manufacturers of Hack Saws Unexcelled

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STEEL *for*

Every Commercial Purpose

We are the only company in Canada producing steel ingots by the "HARMET" Liquid Process, a process that makes these ingots vastly superior to the ordinary kind, improving the physical properties and reducing the waste of ingot.

We can supply forgings of all shapes and sizes made of ordinary or "HARMET" Fluid Compressed Open-Hearth Steel on the Shortest Notice.

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Steel Ingots
by the
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Liquid Process

"The Marshalltown Throatless Shears"

guarantees perfect work at less than half the ordinary expense.

Rotary, self-feeding shears designed for cutting in and out curves, straight or irregular shearing, circles, also beveling and splitting of plates. Built in various sizes having capacities from tin up to ½″ thick. No limit to the size of sheet being cut. Hand, belt or motor drives. The last word in metal cutting shears. We also manufacture Rotary Bevel Shears, Splitting Shears and Plate Milling Machines.

Let us know your requirements.

Marshalltown Mfg. Co.
Marshalltown, Iowa
U. S. A.

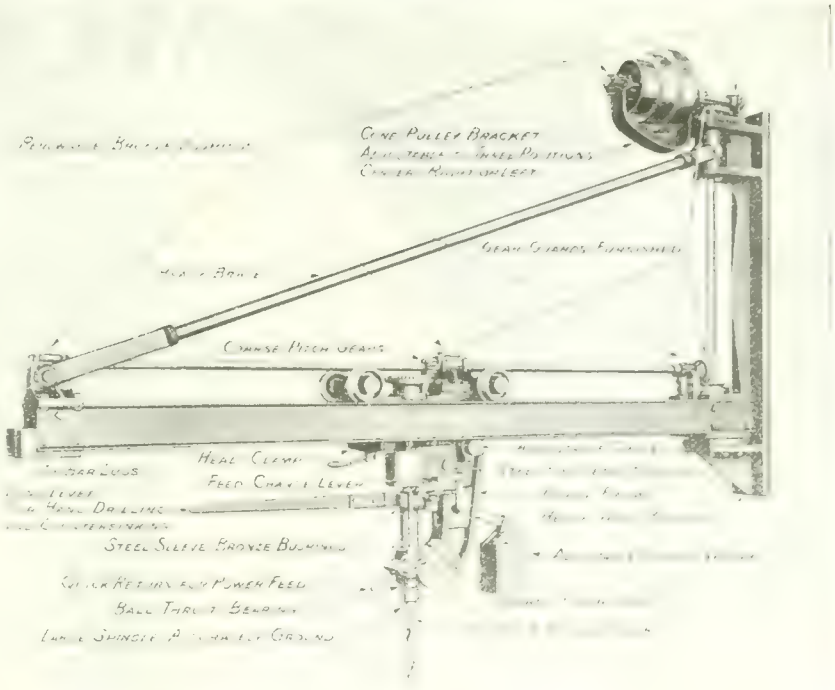
A "Strikingly Different"
WALL RADIAL DRILL

This is a real machine tool. Careful design and high-grade materials contribute to its great success and economy. Much wider range is possible on this drill than the ordinary radial. The head is exceptionally rigid, yet moves with extreme ease from end to end of arm. For the crowded shop this drill is ideal, as when not in use it can be pushed back out of the way.

MADE IN FOUR STANDARD SIZES

Rated size	Drills to center of	Wall to end of arm
7 ft.	14 ft. circle	10 ft.
9 ft.	18 ft. circle	12 ft.
11 ft.	22 ft. circle	14 ft.
13 ft.	26 ft. circle	16 ft.

F.O.B. Boston, Mass.



LYND-FARQUHAR COMPANY
419-425 Atlantic Avenue **BOSTON, MASS**

This Machine—the Forbes—

Feeds the Cutters to the Job

Moreover, readily carried to the pipe inside the shop or anywhere out in the yard.

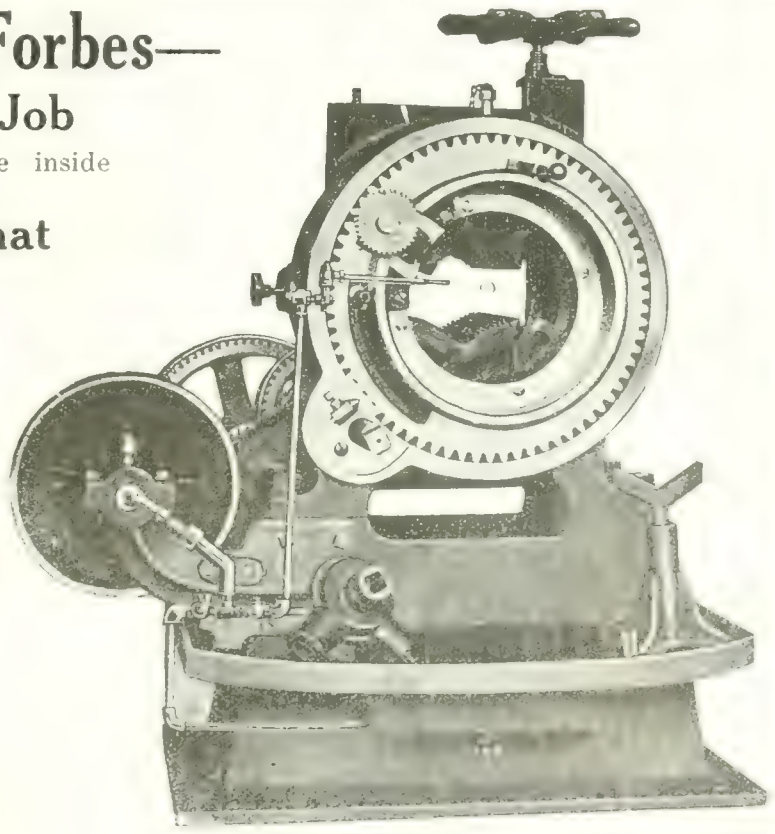
It Cuts Clean Threads that Make Tight Joints
ON THE SPOT

The pipe remains firmly fixed in the self-centering vice. The dies, revolving, cut-off or thread, as the case may be.

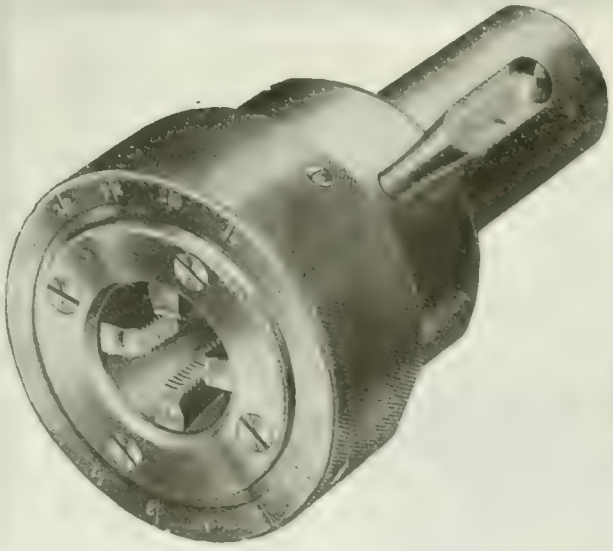
More than 25,000 Forbes Machines now in use support our claim that the Forbes is the greatest labor-saving device on pipe work.

All sizes up to 15-inch, Hand, Belt or Electric power, can be shipped promptly.

Wire your order at our expense

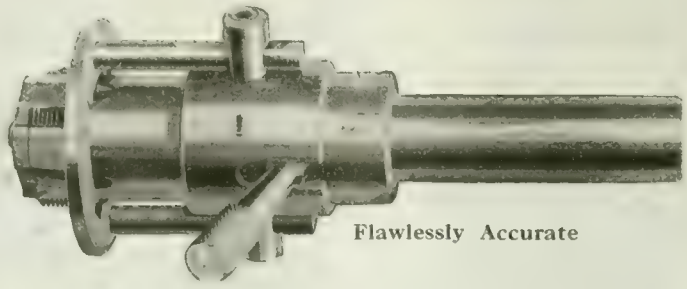


Curtis & Curtis Company
115 Garden St. Bridgeport, Conn.



MURCHEY

COLLAPSING TAPS and SELF-OPENING DIES



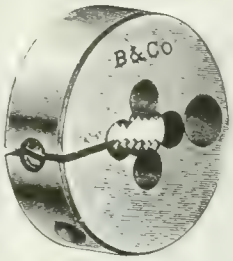
Flawlessly Accurate

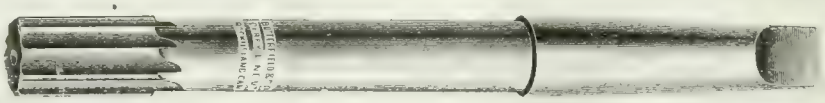
Wonderfully Fast and Durable

Two Murchey Taps on your lathe completely finish these so that when they come off the machine there is no more handling or resizing to do. No need of taking out of one lathe and putting it in another. No reversing, no stripping. No chance of work getting off centre. Do work more accurately and 50% faster than solid tools. Murchey Chasers are quickly adjusted to compensate for wear, and Murchey Adjustable Taps serve as long as ten solid taps. Write at once for full particulars.

Murchey Machine & Tool Company, Detroit, Mich.

THE COATS MACHINE TOOL CO., Caxton House, Westminster, London, England, Glasgow, Newcastle-on-Tyne.
FENWICK FRERES AND CO., 15 Rue Fenelon, Paris France.





Butterfield Taps, Dies, Reamers Drills, Milling Cutters

Butterfield quality gives the Maximum returns on your investment. BECAUSE

It ensures **clean and accurate cuts** and will duplicate the work over a long period of use.

Butterfield Quality is the result of 35 years' continuous effort to keep our product distinctly in the lead from the standpoint of efficiency and economy.

SEND FOR OUR CATALOGUES. Catalogue Seventeen covers Taps, Dies and Reamers. Catalogue "A" covers our line of Twist Drills, Gear and Milling Cutters.

Butterfield & Co. Inc., Rock Island, P.Q.

Toronto Office: 220 King Street West

Its integrity is established by our will, skill, experience and ability to make a chuck of acknowledged superiority and conceded merit.

THE JACOBS MFG. CO. HARTFORD, CONN. U.S.A.

CUSHMAN

We've been Manufacturing

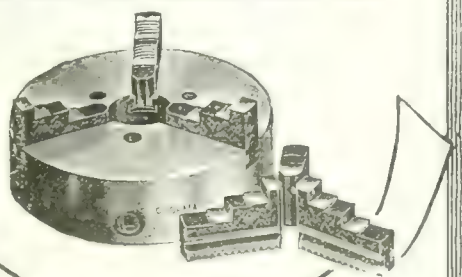
Nothing but Chucks and Their Accessories

FOR NEARLY 60 YEARS

AND OUR PRODUCTS SHOW IT

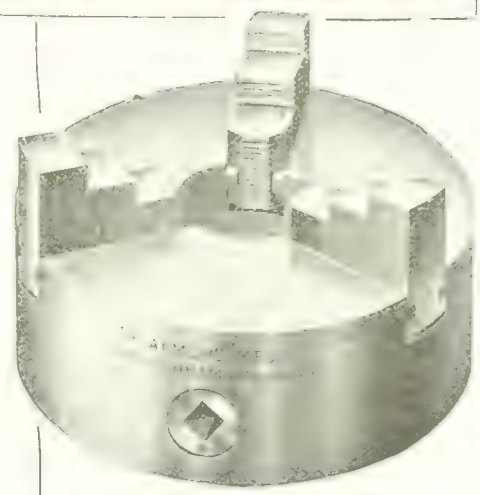
Years of experience in using our tools has convinced manufacturers that the word "Cushman" stamped upon a chuck is a guarantee of its quality and efficiency.

Let us send you our catalogue.
Cushman Chuck Co., Hartford, Conn., U.S.A.

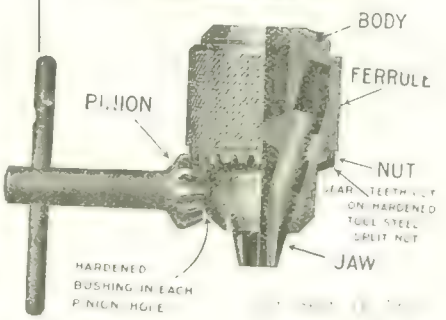


ALMOND
CHUCKS & MICROMETERS

Give them a try out. Universal Geared Scroll Chuck—Sizes 5", 6, 7½, 9 and 12.



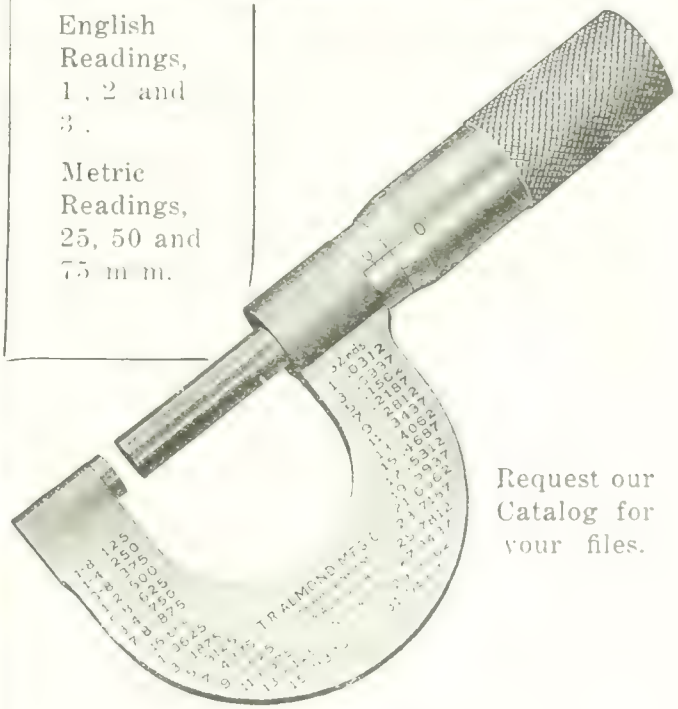
Geared Nut Drill Chucks, in various capacities, 0" to 1".



Micrometer Calipers—

English Readings, 1, 2 and 3.

Metric Readings, 25, 50 and 75 m m.



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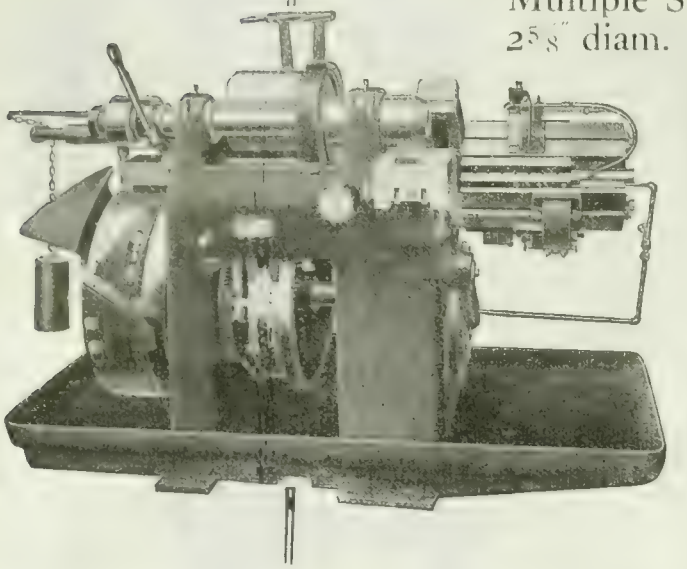
T. R. ALMOND MFG. CO.
6 Maple Avenue, Ashburnham, Mass.

GRIDLEY AUTOMATICS

For the rapid and accurate production of turret lathe work AUTOMATICALLY. Single Spindle Type, capacities up to 5″ diam.

Multiple Spindle Type, capacities up to 2⅝″ diam.



The National Acme Company

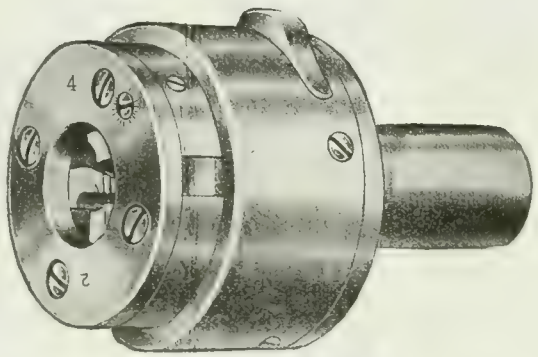
Cleveland, O.

New England Plant: - Windsor, Vt.
Canadian Screw Plant: - Montreal, P.Q.

Branch Offices:

New York Boston Chicago Detroit Atlanta San Francisco
Warehouses: New York Chicago With Foreign Representatives

Makers of Gridley Single and Multiple Spindle Automatics at Windsor, Vt., and Acme Automatics, Threading Dies and Screw Machine Products at Cleveland, O.



H & G Die Heads

are of small outside diameter compared with the size of work they do.

The H. & G. illustrated is an automatic, self-opening Die Head designed especially for use on Gridley and National Acme Multiple Spindle Screw Machines and others that use the die in a revolving position. The four sizes of this Head cut up to 9/16″, 1″, 1¼″ and 1½″.

All parts are hardened and ground and interchangeable. In a word—it's an H. & G.

Ask for Catalog

Eastern Machine Screw Corp.

New Haven, Conn., U.S.A.

B-T THREAD LEAD INDICATOR

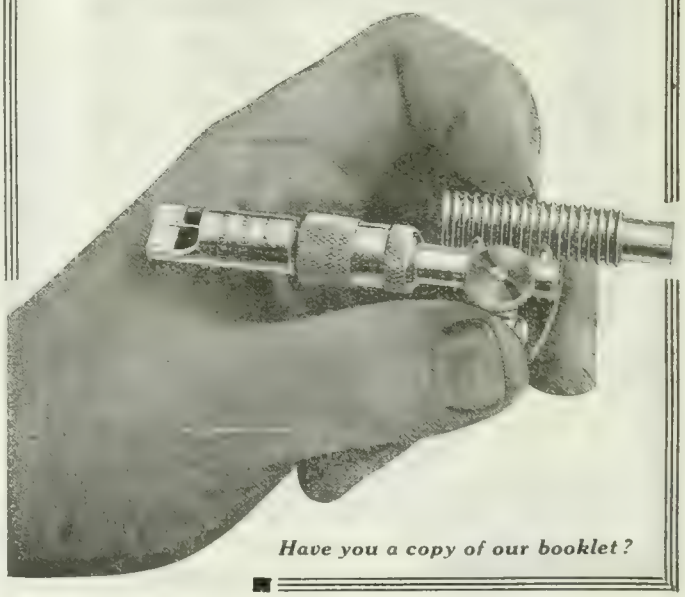
Be Sure You're *Right*—Then Go Ahead

Getting the right thread lead instantly, and maintaining a constant check upon it, minimizes the possibilities of delays in assembling and reduces the number of parts scrapped through incorrect measurements.

B-T Thread Indicators detect errors of one thousandth of an inch from correct lead. They are easily read—absolutely accurate—and can be used for testing odd pitches, as well as external and internal threads.

BICKNELL-THOMAS CO.

GREENFIELD, MASS.



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Carborundum and Aloxite Grinding Wheels Will Give the Utmost in Foundry Grinding Service

HIT or miss grinding in a foundry has never yet paid. The idea of getting any sort of wheel so long as it is cheap, is a mighty costly practice.

Real grinding efficiency comes from having the right wheel in the right place.

Its cost should be based on the work it does—on the length of its service—not on its price.

The aim of Carborundum service is to give you a wheel definitely suited to your grinding job.

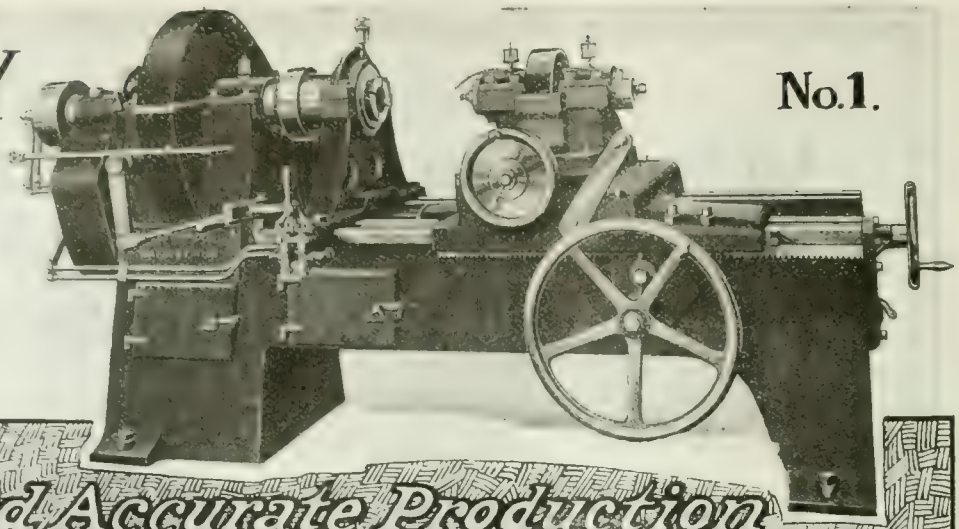
A wheel of the right grit, grade and size—Carborundum for cast irons, brass bronze and aluminum. Aloxite for malleables and steel work. But before sending you any wheel, we must know what you are grinding and how.

Our Service Department is Yours—Make Use of It

THE CARBORUNDUM COMPANY, NIAGARA FALLS, N.Y.

SMALLEY

General Thread Milling Machine



No.1.

For Fast and Accurate Production

Investment in labor-saving devices is not an expense. The real expense is the constant daily leak through the pay roll. The **Smalley General Thread Miller** is the great economizer of human effort. Its accuracy, its convenience and speed justify the investment of capital necessary to its installation wherever quantity thread milling is done. This modern machine tool has two speeds and will mill in one minute 2 to 12 inches, or turn 15 to 30 feet. Pay you to write for full description of this cost-cutter.

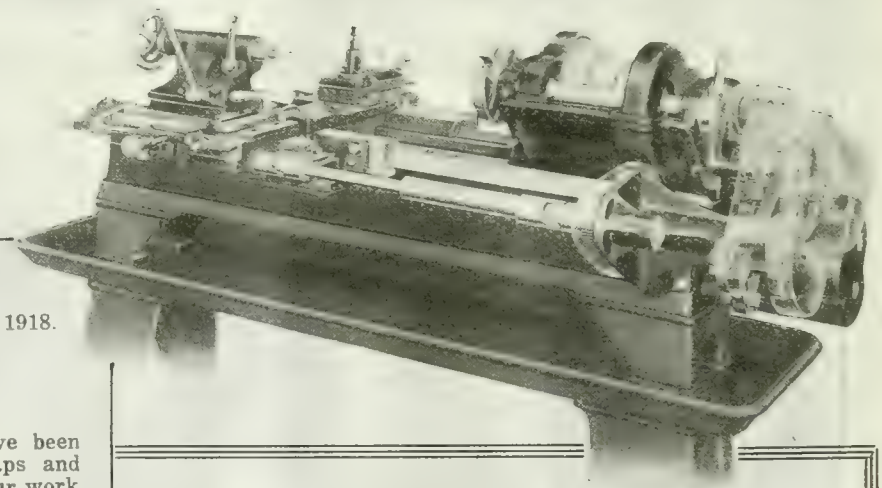
Smalley-General Company, Inc., Bay City, Mich.

Canadian Agents: Rudel-Belnap Co., Limited, Montreal and Toronto

One Customer Says:

"We have the best Lathe in The City of Cleveland to-day"

READ THIS LETTER



B. & W. TOOL & DIE CO.
102 St. Clair Avenue, N.W.
Cleveland, Ohio, Nov. 19th. 1918.

Mulliner-Edlund Tool Co.,
Syracuse, N.Y.

Gentlemen:—

Since installing your "12" Lathe, we have been practically running on Thread Gauges, Taps and Dies, since the 1st of June this year. All of our work has been subject to the Bureau of Standards Inspection, we have readings in our files which are open to inspection to anybody and in any of these readings, we do not find a greater lead error than .0003 in ten to twenty threads and in many cases, absolutely nothing. Our pitchers range from 12 to 40. We consider that we have the best lathe in the City of Cleveland to-day and this statement can be verified by the local Bureau of Standards.

We desire to thank you for the very courteous service furnished us through your Mr. Bull and we feel his personal attention has been instrumental in the successful service your lathe has given us.

With best wishes, we are,
Yours truly,
B. & W. TOOL & DIE CO.
By J. A. Walton

JAW/C"

This is the Kind of ACCURACY for Your Tool Room Work

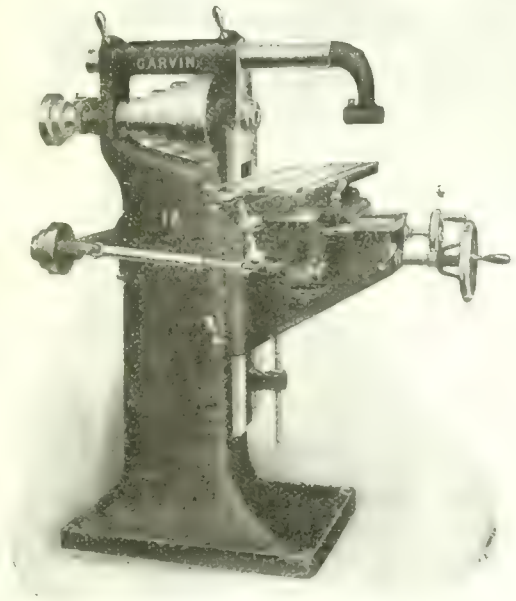
Great Strength and Rigidity, too, Characterize the

MULLINER QUICK CHANGE LATHE

The quick change mechanism gives 37 different threads and feeds. Another feature is the ring self-oiling system. Sizes, 12-in., 14-in.; beds, 4-ft., 5-ft., 6-ft. Send for the full details of this ideal precision tool.

Mulliner-Enlund Tool Company
SYRACUSE, N.Y.

GARVIN



No. 12 Plain Milling Machine-Use Code Abrade

NO. 12 PLAIN MILLING MACHINE

FOR ALL LIGHT MANUFACTURING

This machine is built especially strong and substantial for a tool of its capacity, and has many valuable features worthy of special mention. The slide is fitted with a quick pitch screw, giving one inch per turn. This combines the rigidity of a rack feed with the steadiness of the screw feed. The table has an oil pan all around it, with finished edges—automatic feed, trip and reverse—adjustable nut on the feed screw to take wear—the Feed Screw is hardened.

Adjustments .....**18 x 6 x 15 in.**

For Further Information ASK YOUR DEALER or WRITE US DIRECT

IMMEDIATE DELIVERIES

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Manufactured by

THE GARVIN MACHINE COMPANY

Spring and Varick Streets *(Visitors Welcome)* **50 Years New York City**

H. COLLIER SMITH

"QUICKWORK"

Registered U.S. Patent Office

ROTARY SHEARS

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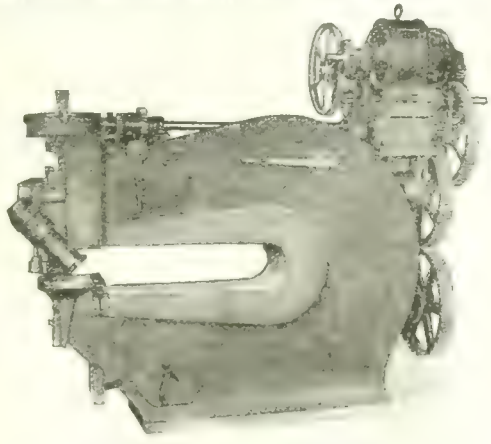

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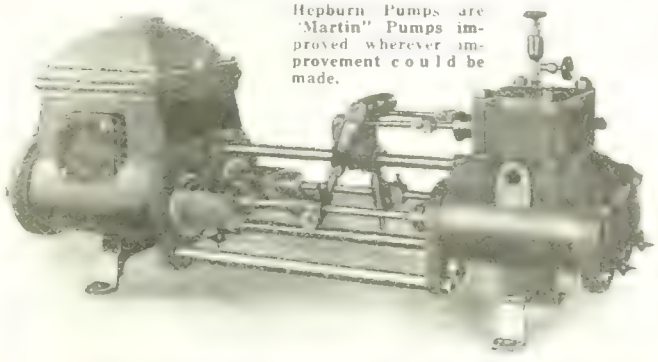

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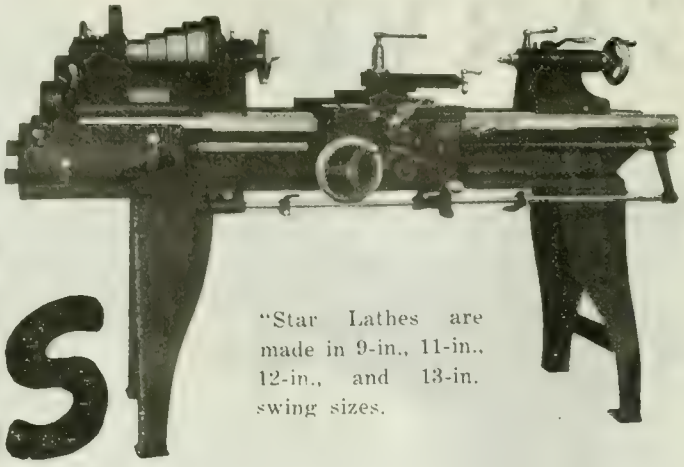

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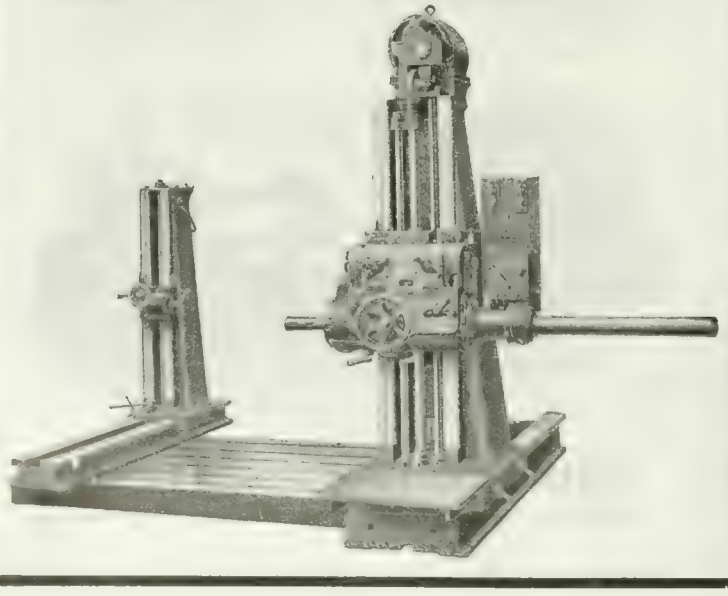

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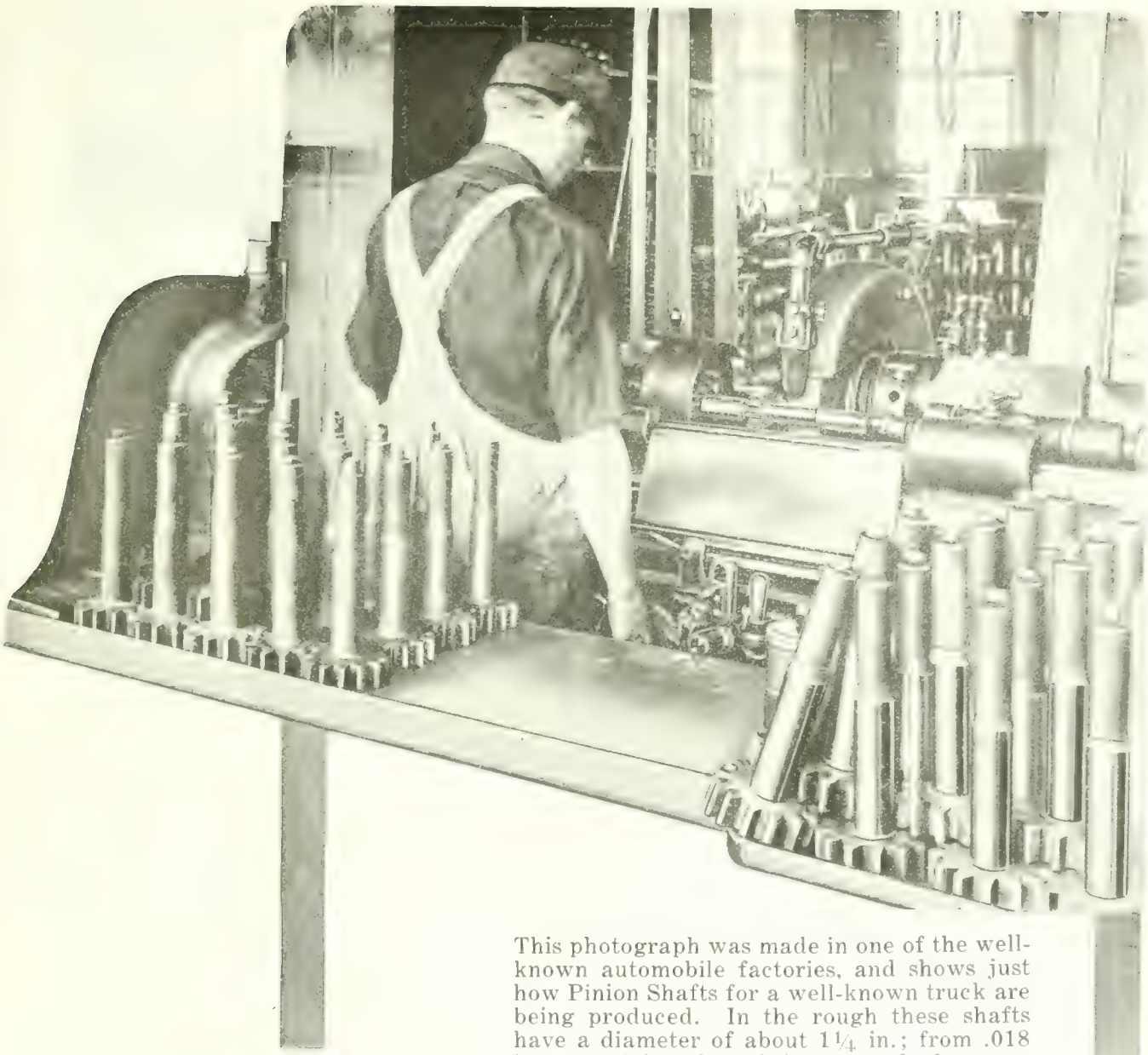

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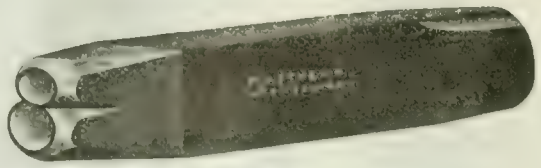

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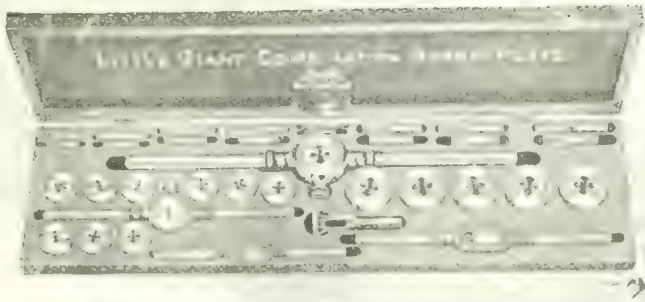

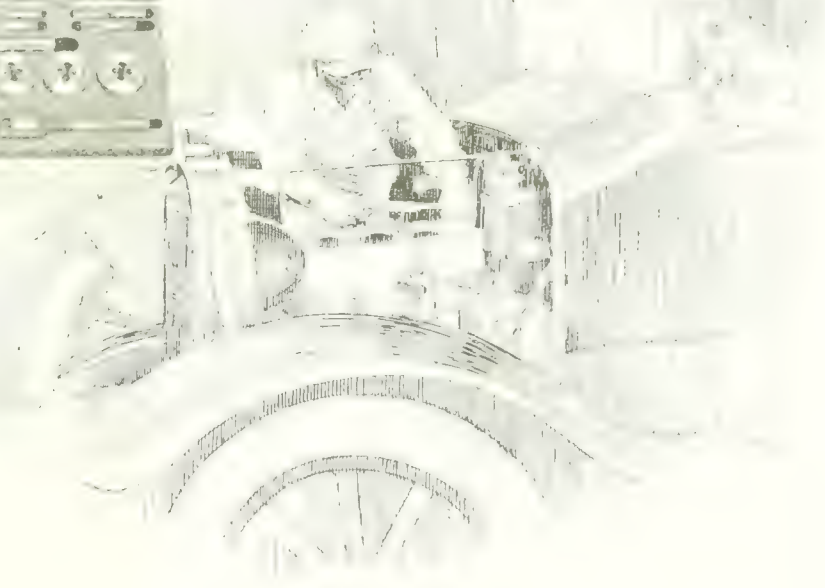

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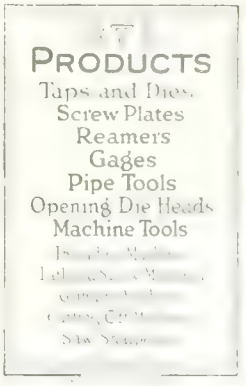

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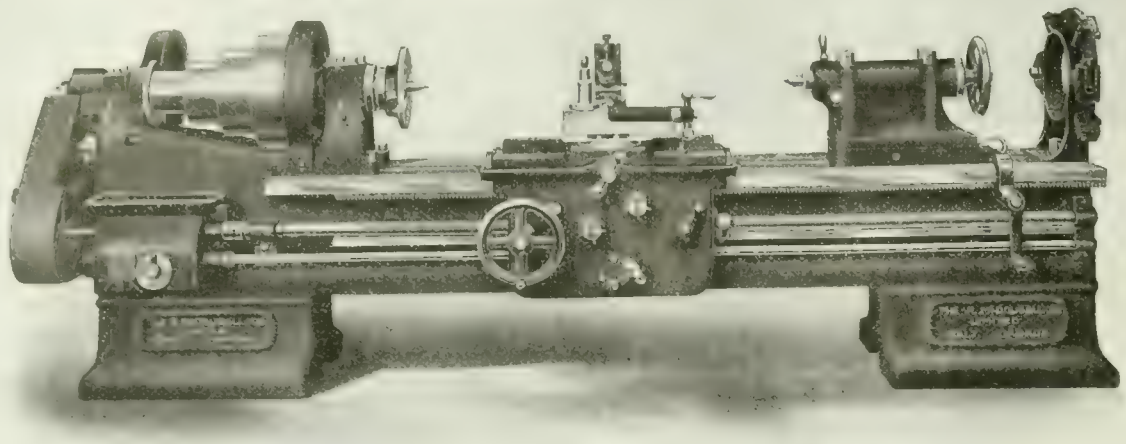

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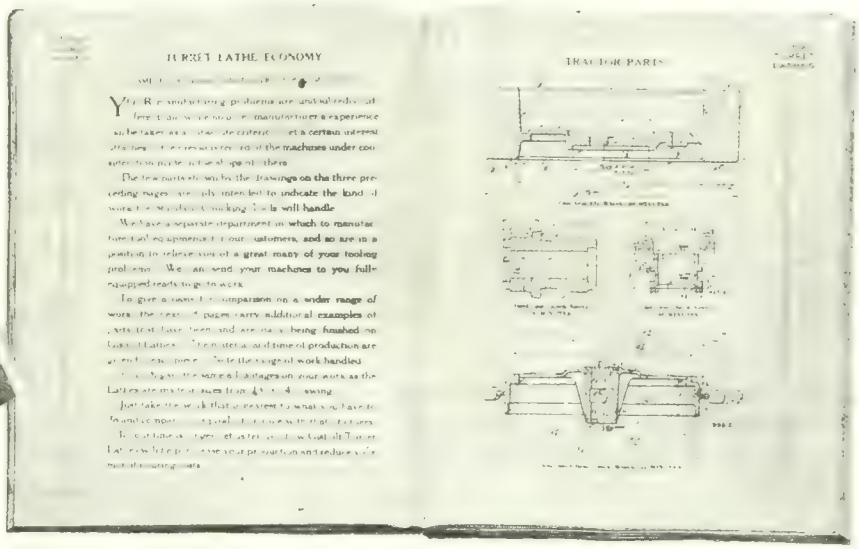

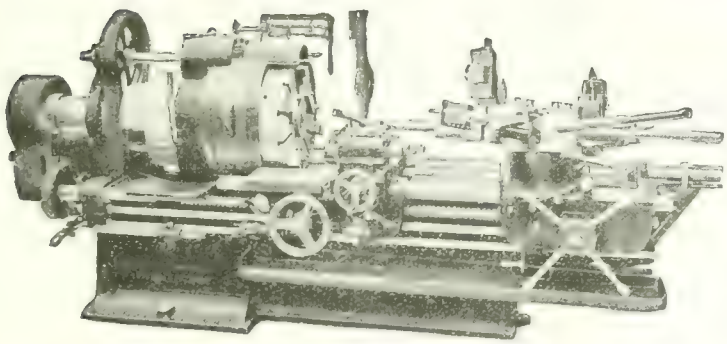

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CANADIAN MACHINERY
AND
MANUFACTURING NEWS

Volume XXI. No. 15 April 10, 1919

Manufacturing the Banner Hosiery Machine, Part II

Being a Continuation of the Previous Article on This Subject—Further Operations, Together With Photographs, Are Described in Detail—Part Three Will Follow at a Later Date

By ROBERT MAWSON

IN the previous instalment of this article some of the special fixtures used by the Hemphill Mfg. Co., Pawtucket, R.I., for machining elements used on hosiery machines known by the trade name of "Banner" were described. All the examples shown and described were operations performed on Jones and Lamson automatics.

In this part of the article some other equally interesting illustrations of work done with special fixtures on Jones and Lamson will be shown and described. Afterwards the machine tool departments will be treated in a similar manner.

When machining the carrier ring the first two operations are performed on Jones and Lamson machines.

The machine performing the first operation is shown in Fig. 1.

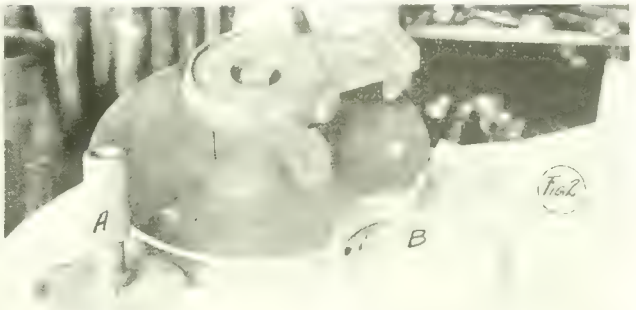
The casting is located by being held in three jaws at A, B and at the rear.

All these jaws are made with a fixed stop provided with a steel block, as may be seen; another block being tightened toward the casting forces it against the former block noted.

The casting is also pushed into the jaws until the lower surface of each lug comes against a locating pad.

At the lower part of the fixture a stop C is provided, thus accurately locating the casting in relation to the centre axis of the machine. The large hole is then bored to a gauge and the outside face machined until the flange is the correct thickness.

Note might be called here to the face



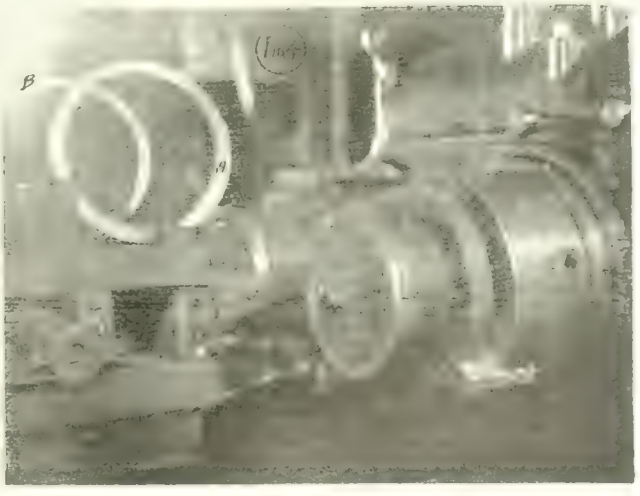


FIG. 1. FIRST MACHINING OPERATION ON CARRIER RING. FIG. 2. SECOND OPERATION OF CARRIER RING. FIG. 3. FIRST MACHINING OPERATION ON SINKER HEAD. FIG. 4. SECOND OPERATION ON DRUM CAM RING.

plate of this machine, on which may be seen a number of machined recesses.

These are for locating different fixtures, each of which is machined on the outside until it fits accurately into one of the recesses shown, thus insuring the axes of machines and fixtures coinciding.

The half tone Fig. 2 shows the fixture used when performing the second operation on the carried ring. At A may be seen one of the conventional type of plug gauges, this being used for testing the large bored hole in the first operation. The casting is located on an expansion plug which fits inside the large bored hole, the construction and method of operating the expanding medium being the same as described in the first section of this article. It will be seen that on this fixture the expanding plug is slit into four parts. There have been at different times discussions in various mechanical magazines, on which was the correct method and number of sections to split an expanding arbor, some writers quoting the and others four, or more as the proper divisions. It may be said here that at this plant some arbors are made with three, others four, and in some cases more, in each case equally good results being obtained. It seems, therefore, that satisfactory results may be obtained, not by the number of sections, but rather by the accuracy of the tool maker's work which is put into the tool.

After the ring has been placed on the arbor as shown, and the centre plug expanded, the outside edge and the face is machined, the tool being located and held on the Jones and Lamson automatic, as previously noted. One of the finish machined carrier rings is shown at the right of the fixture at B.

Machining the Sinker Head

The first operation when machining the sinker head is boring the inside large hole. For this purpose the casting is held on a three-jawed universal chuck, and the hole bored to a plug gauge, The casting is then placed on the special fixture Fig. 3, which is attached to the face plate of a Jones and Lamson automatic. The casting is held by the expanding arbor of the chuck being operated in the manner previously described. The edge of the casting is then faced, the outside turned and a groove machined on the outside periphery. The different tools used for these operations are held in the various stations of the machine turret. The sinker head shown in the half tone is one which had the various operations noted performed on it.

The illustration Fig. 4 shows a two spindle Jones and Lamson set-up for machining drum cam rings, for the second operation. One difficulty in performing this work is caused by the rings being somewhat thin in section, their dimensions being 7 in. outside diameter and only ⅜ of an inch in thickness. The two sides which are faced must be absolutely parallel and to ensure this the expanding arbor is made with a turned shoulder against which the ring is pushed. The expansion of the arbor thus holds the part against the shoulder and is also in a rigid manner for the machining operation. The outside diameter is then turned to the size noted and the outside face machined. The ring is tested by by means of a go and no go gauge, so that the correct thickness is obtained. On the top of the turret may be seen a ring A before it has been machined by the second operation and one at B after the work has been performed on it. The two tools used for the machining operation are of the inserted bit type, and may be easily observed by reference to the half tone.

Boring Widening Pick Cams

At this plant a number of fixtures have been designed so that several pieces may be held and machined at one time. A study of some of these will be next made and should prove both interesting and valuable. The illustration Fig. 5 shows the fixture which is used on a Jones and Lamson for boring the widening pick cams. The fixture will hold six castings at once, which are made of malleable iron. The pieces are located by

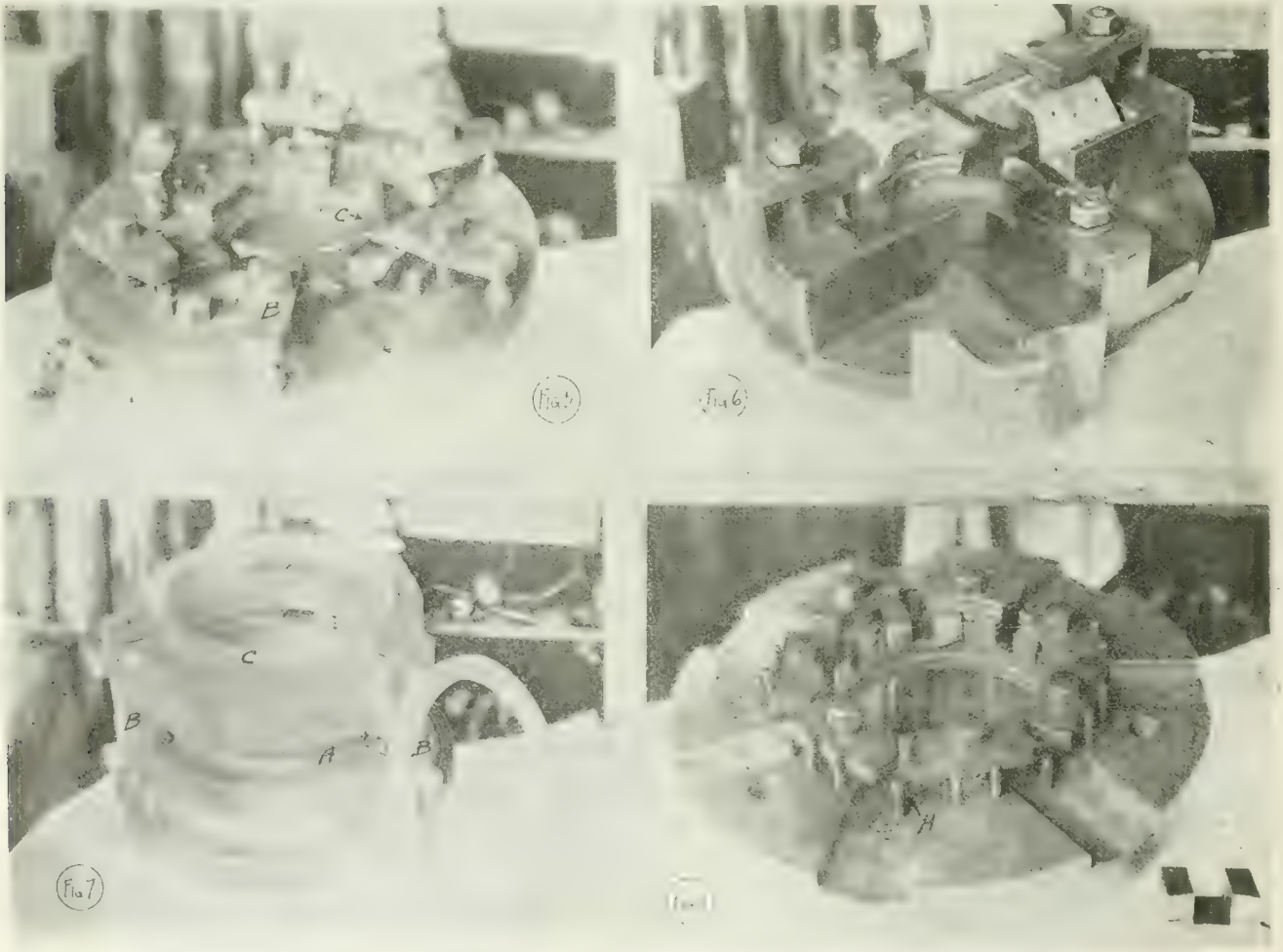


FIG. 5. BORING FIXTURE FOR WIDENING PITCH CAMS. FIG. 6. BORING FIXTURE ON CAM BLOCKS. FIG. 7. FIRST OPERATION ON DRUM CAM RINGS. FIG. 8. FIXTURE TO MACHINE RADIUS ON MOUTH PIECES.

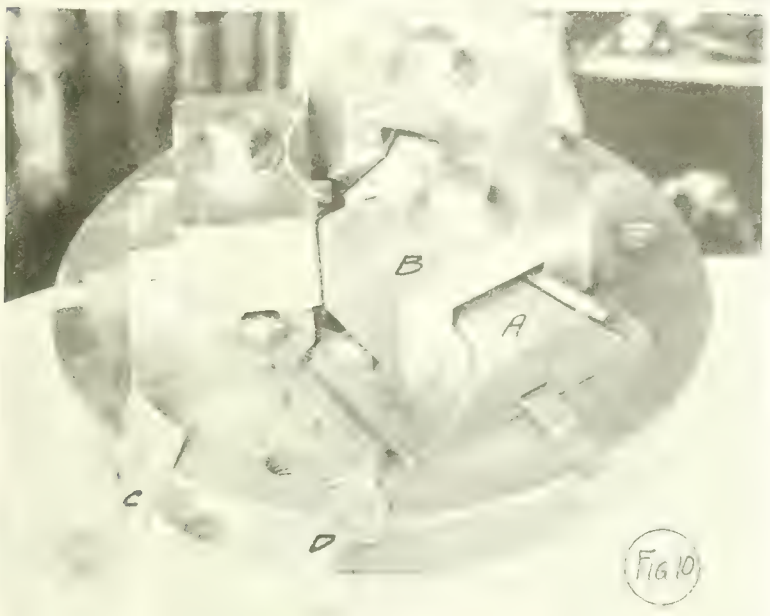


FIG 9—MACHINING PLATEN CAM

FIG 10—MACHINING STITCH CAM

FIG 11—DIAL USED ON AUTOMATICS

between them. The set screws at B are then tightened, which forces down the clamps onto the piece, thus holding it securely. Attention might be called to the construction of the clamps which are provided with a set screw tapped into the outer end. By adjusting this set screw the lever action of the clamps may be diminished or increased as desired. When the castings are in position, and held down, the inside jaws C are bored to a plug gauge, thus obtaining the correct form and diameter required. One of the finest bored pieces may be seen resting against the fixture at the left.

The half tone Fig. 6, shows a fixture used on a Jones and Lamson automatic for boring the cam blocks. This is the last operation on this piece, which is made from a die casting. The outside has been milled to the correct width and the various holes drilled, and a slot machined on the lower face. However, the inner face must be bored to a certain diameter and also true with the outside flanges. The fixture illustrated is used for this purpose.

The tool, it will be seen is designed to hold four castings at one setting. Each of these pieces is located by raised flanges, the inside dimensions being made to suit the width across the parts to be machined. The location outward is determined by a stop pin, against which the casting is pushed by hand. The four straps being then tightened against the upper surface of the pieces as shown hold them securely.

The inside edge is then bored to a plug gauge, and in front of the fixture may be seen one of the finished bored elements with the machined surface upward.

First Operation on Drum Cam Rings Rings

Our next example is the fixture used for the first operation on the drum cam rings, the work being again performed on a Jones and Lamson automatic. This fixture is made to hold two castings at once. The lower piece is slid through the slot A after the three clamps B have been dropped down out of the way.

The supporting ring C is also placed in the position shown by also dropping the holding clamps down. The six clamps, three for each ring, are then adjusted until the outside of the pieces run concentric in the machine. After this has been obtained the clamps are tightened against the pieces to hold them securely.

The inside holes are then bored to a gauge and the upper faces machined and one of the elements after this work has been performed is shown at the right of the fixture. It is obvious that after the operator has faced the upper casting the facing tool must be fed back and then down before a similar operation can be performed on the lower element.

The fixture shown in Fig. 8 is used for machining the correct radius on the mouth pieces. This tool is made with a receiving contour of a similar shape to that which the parts are made. The elements are then pushed into these re-

cesses and against a locating pin as A. When the operator forced them against these stops the clamps shown are tightened, thus holding the elements securely. The inside face is then bored to a plug gauge, and one of the finished machined parts may be observed at the right of the fixture.

Machining Instep Raise Cams

It will be observed that quite a number of cams are used on the hosiery machine; this medium is accurate and sure in its operation and therefore ideal for a machine of this type that is operated largely by women who have the supervision of a number.

The next example will be the machining of the instep raise cam, the duty of which is to raise the cylinder and therefore the needles when forming the instep of the stocking. These are milled on the edges, a hole is also drilled and tapped and a groove milled radially along the outer face. The operation here described is boring the inside surface to the correct radius to suit the outside diameter of the cylinders.

By referring to the half tone, Fig. 9, it will be seen that a Jones and Lamson is again employed for the machining operation. The cams are located by a tongue which is made to suit the milled groove. This tongue extends the full length of the fixture jaw, six of these being provided on the tool. The steel cams are therefore slid into the inside of the jaw and one of the screws shown on the outside screwed into the tapped hole of the element. By this method the tongue locates the piece and the screw holds it in position. The fixture is designed to hold thirty-six pieces, each screw holding a cam. As the method of holding is not very secure and a heavy cut could not be taken, several passings of the boring tool is taken until the correct diameter is obtained, determined by a standard plug gauge.

The boring tool is shown at A, and as can readily be seen, is of a rigid construction to prevent chattering, and thus ensuring a smooth finish. One of the finish bored cams is shown resting on the fixture at B, also the construction of the fixture may be plainly observed.

The illustration, Fig. 10, shows the fixture used when machining the stitch cams. These pieces, when finished, must have the inside face bored to suit the diameter of the cylinder, and further, the face must be at the same angle as the cam blocks, the machining of which has been previously described.

To obtain this dual result the cams are located on pins which are driven in blocks A, which have a similar angle and shape to the cam blocks. The cams, after being placed on the pins, are held in position with the strap B. The fixture is designed to hold six cams, three of the left hand and three of the right hand.

The inside face or edge is then bored to the required diameter. At C and D are shown two finish bored cams, left and right hand respectively. The fixture is held and located on the face-plate of the Jones and Lamson automatic in a manner similar to that previously described.

Improved Type of Dial Used on Machines

Every operator who has used automatics knows the loss of time caused by setting up work so that interchangeability of finished parts may be obtained. This is caused in a large measure by the rather poor arrangement of feed which affords no certain way that the operator may know exactly how much material is being removed. Much time is wasted by the set-up man testing the various machined surfaces with the aid of micrometers or gauges until the correct or desired results are obtained.

The illustration, Fig. 11, shows an arrangement which has been added to all the Jones and Lamson machines by the Hemphill Company to avoid this trouble. The dial on the feed screw is about six inches in diameter and is graduated on the beveled edge to read to 1,000 parts of an inch, figured from the travel of the feed screw. A large pointer has been also attached to the machine as shown, the point being in line and close to the graduated edge. Around the circumference of the beveled edge is machined a slot which may be seen by referring to the half-tone. Small discs are held in this slot by means of a setscrew, which taps into retaining nuts and can slide freely in the circular slot. There are the same number of discs attached to the dial that there are stations in the turret of the machine or tools used for the machining operation. These discs are marked on the quarters with the numbers 1, 2, 3, 5 and 6, according to whether the machine is a 4 or 6 turret.

To operate the dial arrangement, taking for an example station No. 1, the operator machines the part in question until he obtains the correct size. He then places one of the discs with the No. 1 directly in line with the pointer and fastens it there by means of the screw tapped into its retaining nut. A similar procedure is followed out for all the other stations, care being taken to place the No. 2 on a disc for No. 2 station and so on for each. The machining operation on any piece is then much simplified, the man being only called upon to turn the dial by means of the staves until the disc with the same number as the station operating is in line with the pointer, when he is sure to obtain the desired size required.

A further advantage of the arrangement is that, should the operator desire to take a thousandth of an inch more off a certain section, it is only necessary for him to turn the disc in question so that the pointer will be opposite one graduation past the line indicated by the disc. These spaces representing one thousandth of an inch of feed or material removed on the diameter are well separated owing to the large diameter of the dial plate, and thousands of an inch can be easily split into half thousands, or even quarter thousands, depending on the accuracy of the operator's eye. However, for ordinary manufacturing work, thousandths of an inch are usually considered close enough, and when exact work is desired or necessary, grinding after the turning operation is resorted to.

It will be noticed that the index for the various turret stations provided with the machine is in close proximity with the special dial arrangement here described, and therefore chances of error which might occur by the operator setting a different number of disc to a certain turret station is remote and would be caused by rank carelessneess only. Under the arrangement here illustrated much worry is removed from the man's mind, enabling him to do better and more productive work. It is found also that the operator quickly becomes accustomed to the arrangement which in a very short time may be considered automatic in its nature.

About Unemployment.—Frank Watkinson, at the Toronto Labor Temple, estimates that there are between twenty and twenty-five thousand men out of employment in the city, and that this number is daily increasing by reason of the number of soldiers who are returning to Canada, and who have finished their vocational training courses and are upon the Labor market. A more conservative estimate by a public official places the figure between ten and fifteen thousand. The Ontario employment office in Toronto has positions on farms for five hundred men. Of this number one hundred and twenty-five are for married men. Officials there seem to believe the Labor situation is not serious, as they are experiencing difficulty in placing men on farms; even those with farm experience are not trying to locate themselves in the country as a medium of earning a living. The official stated that if there were 25,000 men out of work in the city, that close to 20,000 had enough money to live on for some time, as they were not applying for work.

Scotia's Annual Meeting.—The annual meeting of the Eastern Car Co. and the Nova Scotia Steel and Coal Co. was held at New Glasgow. At the meeting of the former company the directors recommended for payment a dividend of six per cent. on the preferred shares. Two years' dividends were due on this stock and the dividend now declared, and which is payable April 15, is for the year 1917. It was decided not at this time to pay a dividend for 1918. The company has orders on hand from the Government that will keep the shops going for three months. D. H. McDougall was re-elected president, and W. D. Ross, of Toronto, was elected vice-president. At the Steel Company meeting only the ordinary business was transacted and reports of President McDougall and the directors were presented. The former directors were elected without change. Col. Thomas Cantley, chairman of the board of directors, presided. The work of overhauling the plant is still going on.

Shop Arithmetic; Use of Decimal Fractions

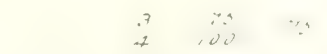
The Third of a Series in Practical Mathematics For the Mechanic and Those Learning the Machinists' Trade—The Present Article Takes Up the Subject of Decimal Fractions and Explains the Micrometer

By J. H. RODGERS

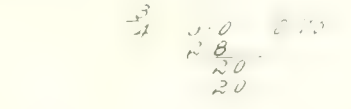
STANDARDIZATION in every branch of industrial activity, calling for greater accuracy in manufacturing machine tools of every description, to insure of interchangeability, now demands much closer measurements than are practically possible by the use of ordinary or vulgar fractions. Probably the smallest graduation that can readily be determined without the use of scientific measuring instruments is one-hundredths of an inch, and divisions that have a smaller value than this cannot be correctly marked on the ordinary steel scale, and even if they could their value would be negative, owing to the fact that the eye of the average mechanic is seldom, if ever, trained to such close observation, nor would it be considered advisable from a mechanical or physical standpoint. The principle upon which all precision measurements are calculated is derived from the decimal system. This method of finding accurate distances and angles is incorporated into every form of computation, whether it be mathematically or scientifically applied.

In respect to common or vulgar fractions it will have been noted that the denominator could have been expressed by any number, but as the name implies, decimals are numbers represented by a tenfold increase or decrease, so that decimal fractions would have for their denominator the numbers 10, 100, 1000, etc.; or in other words, 10 or some power of it. It is seldom, however, that the denominator is used when expressing decimals, the value being determined by the position of the various figures in relation to the decimal point. Referring to Chart 1 it will be seen that the decimal point is located between the whole number and the first figure of the decimal fraction. When a decimal part of a unit is to be expressed alone, the decimal point will be located at the extreme left of the number.

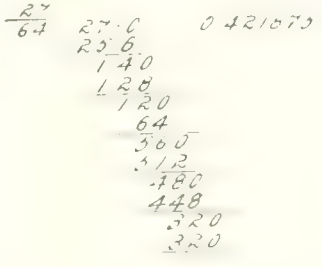
Before going further it may be well to show how a vulgar fraction is changed to a decimal of the same value. Suppose it is required to express ¾ as a decimal. It has previously been stated that the denominator of a decimal fraction is always 10 or a power of 10. Therefore, it is necessary to change ¾ to a fraction having a denominator of 10, 100 or other power. For an accurate conversion it will be required that 4 be a factor of the new denominator; thus, 4 is not a factor of 10, but is of 100, therefore, by the method shown in the last lesson the new fraction and the decimal equivalent will be:



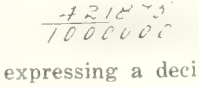
The above has been given to show the process of conversion, but the simple method is to divide the numerator by the denominator for the direct result; for instance:



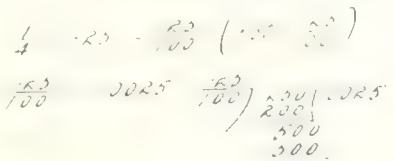
To make the above conversion more clear. It will be seen that the 4 is not contained in the 3, so that it is necessary to alter the expression in order that the division may be performed. To do this, place a decimal point after the 3. and likewise in the quotient, and annex ciphers to the dividend until the work is completed, proceeding as in the ordinary division. What is the decimal equivalent of 27-64?



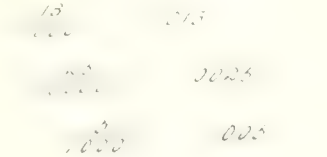
This would read: four hundred and twenty-one thousand, eight hundred and seventy-five millionths.



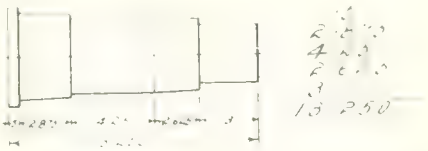
When expressing a decimal as a vulgar fraction care must be taken to move the decimal point. For instance:



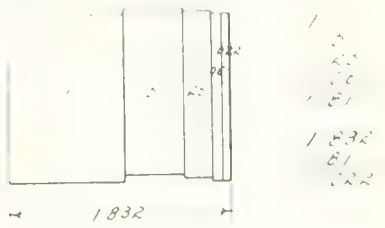
It will be well for beginners to become familiar with Chart 1, showing the relative value of the different positions to that of the decimal point. Thus:



Addition of decimals is much the same as whole numbers, the essential point being to place the various numbers in a systematic order, so that the decimal point will always come in the same vertical line. This is imperative for accurate calculation. Example: To check up the overall length with the various detail dimensions in the wrist pin here shown.



No difficulty is experienced in subtraction of decimals, as it differs very little from the integral method, the same precautions as previously described being adhered to. In making up a dimension of, say, 1.832 inches from standard measuring blocks, as here shown, it is desired to know the thickness of the fifth block A.



In addition and subtraction, position of the digits is of vital importance, but in multiplication and division, location is neglected for convenience of calculation. The essential consideration in multiplication is that the product will contain decimal places equal to the sum of those in the multiplicand and the multiplier. Thus:

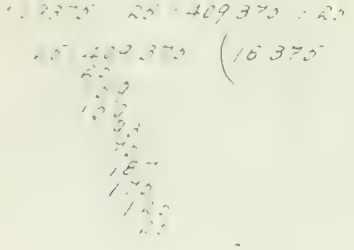
It will be seen that when the above multiplication is completed there is only five places in the product, so that it is necessary to add a cipher on the left to complete the problem. In this instance the decimal point happens to fall in the same position, but the result would be the same in any case.

The cipher to the right may be eliminated as it has no value.

When dealing with fractions it was stated that the constant accepted as the ratio of the circumference of a circle to its diameter was 3 1-7, but while this is reasonably accurate, the constant generally recognized and used in all engineering practice is 3,1416. Using this latter multiplier, what would be the circumference of a sphere 18 inches in diameter?

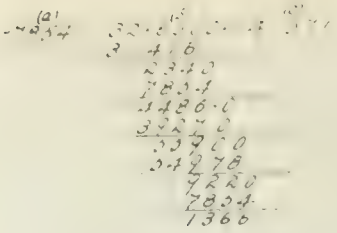
The division of decimals is virtually the same as the division of whole numbers, but owing to the presence of the decimal point, is often confusing to beginners. Some advocate the entire neglect of the decimal conditions until after the division has been performed, and then locate the point in the proper position in the quotient. The writer, however, prefers to eliminate the decimal point in the divisor before the work is commenced, by moving the point in the dividend to the right sufficient to make the divisor a whole number. That is, by multiplying the divisor and the dividend by the same number does not alter the conditions of the problem. This rule was explained in dealing with vulgar fractions. For instance, to divide

multipy each number by 100, by moving the decimal point two places to the right, thus:

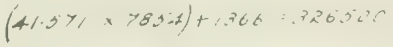


With this method the decimal point is always treated as one of the figures in the dividend and brought down and also placed in the quotient at the same time. To divide 32.65 by .7854, place the numbers as in ordinary division, as:

To convert the divisor to a whole number it is necessary to multiply it by 10,000, and to maintain the relative value of the problem it is likewise necessary to treat the dividend in the same manner. This can be done by simply moving the decimal point four places to the right, adding ciphers in the dividend if required. The question then becomes:



In work like the above, where many figures are involved, it is always well to check the work. This can be done by the method explained in the first lesson —by casting out the nines. To prove division, the process is simply reversed: that is, multiply the quotient by the divisor and add in the remainder, the result should correspond with the dividend. For the above question the proof would be:



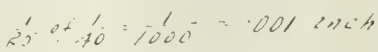
However, to work this out in detail, entails considerable effort, and the chances of error are quite evident, and therefore, the simple method of "casting out the nines" is suggested for checking problems involving many figures. With the index letters a-b-c-d, representing the final remainders after casting out the "9's", the rule for proving may be expressed as:

which is the general rule given above.

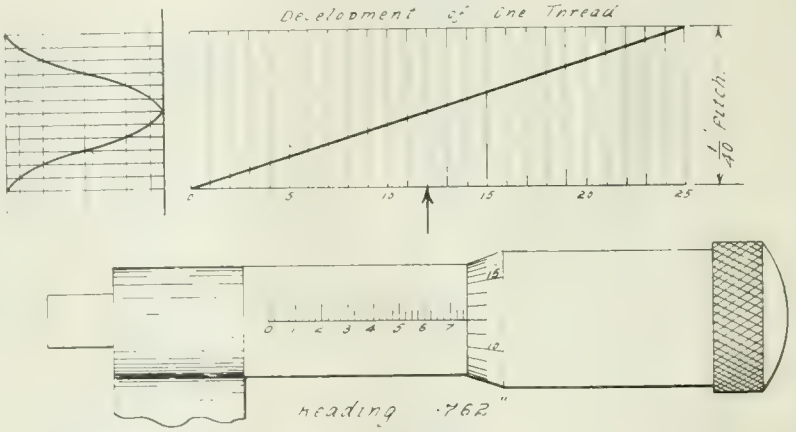
This can be done mentally, and with absolute accuracy, after a little practice, thus offering an immediate check on the correctness of the work.

The instrument that demonstrates the practical application of the decimal system, and one of direct interest and vital importance to the engineering student, is the now widely used micrometer caliper, or simply micrometer.

The use of this instrument differs from the ordinary steel scale chiefly in the fact that the measurement is scientifically controlled, and the degree of accuracy is dependent more on the sense of touch than that of observation, although accurate reading is essential. It is not proposed to go into details regarding the construction of these precision tools, but a brief examination of their operation is necessary to demonstrate their relation to the decimal system. The pitch of the thread that is cut on the spindle, and which controls the lateral movement of the spindle, is 1-40 of an inch, or in other words, the screw has 40 threads per inch, and the circumference of the thimble on the inner end is graduated into 25 equal divisions; therefore a circular movement of one division advances the spindle:



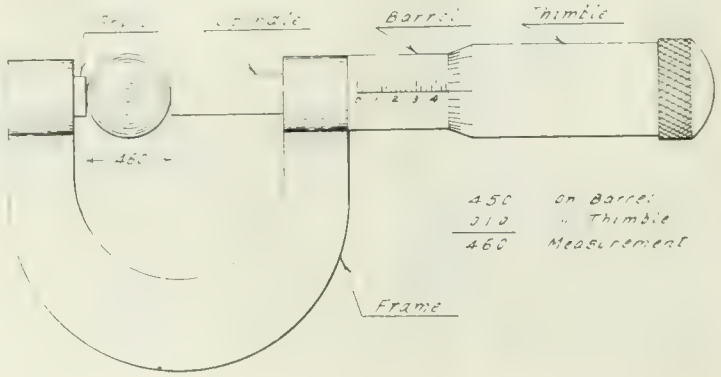
To illustrate more clearly how this reading is obtained, the sketch below



shows, on an enlarged scale, the development of one thread of the screw, and the thimble graduations.

Continued on page 354

For this specific problem the proof would be:



Getting Down to a Peace-Time Basis

Showing How One Firm, Utilized a Special Purpose Machine For Peace-Time Work, With Very Little Change or Expense to the Original Design—This Idea is Worthy of Note

By J. H. MOORE, Associate Editor CANADIAN MACHINERY

SCRAP those machines; they are no further use to us in our regular business. How often have you heard this same expression when speaking of machine tools used specially in the shell making business during the war-time rush? Quite often, no doubt, and perhaps in some cases with very good reason. Yet, are there not many tools still with a good peace basis life before them, scrapped because of the erroneous idea that once a shell tool, always a shell tool, or nothing?

It is not the intention of this article to convey the impression that every type of machine used for shell work can be converted into regular peace lines, but, the article does point out, one striking case in point where a cut-off machine, used to trim off the shell billets, and casings to size, was converted into a turret lathe with very little trouble or expense.

Not alone this, but owing to the large hole through the regular spindle head of this machine, its capacity for its relative floor space was much larger than could have been otherwise obtained. Another feature which helped the rigidity of this machine was its construction of cross feed carriage. The cut-off work, which it was called upon to do in war time, is an exceedingly rough and hard operation, causing considerable strain on the machine in general. For this reason, the carriage was originally designed to withstand such strain, therefore is of splendid rigid construction for such work in combination to the regular turret. The cross feed is also driven by means of a large bronze worm wheel, and even with very heavy duty no chattering is in evidence, which often happens on the ordinary turret lathe if too heavy a cut is fed.

To get directly into the exact procedure employed in the conversion of machine, let us start right at the beginning.

The headstock itself required no change, for at present it is geared about 5 to 1, giving ample driving power. There is also a three-step cone pulley on the lower driving shaft. A glance at the photograph accompanying article will show readers the belt going down to this pulley. The chuck used on the shell work was also O.K. for the new purpose, being of the universal three-jawed type. So we can safely say that absolutely no change to the headstock was required.

As regards the cross slide, its main construction also remains unchanged, the only change being the different type of tools used. Naturally this change was absolutely necessary for any case where different work had to be made.

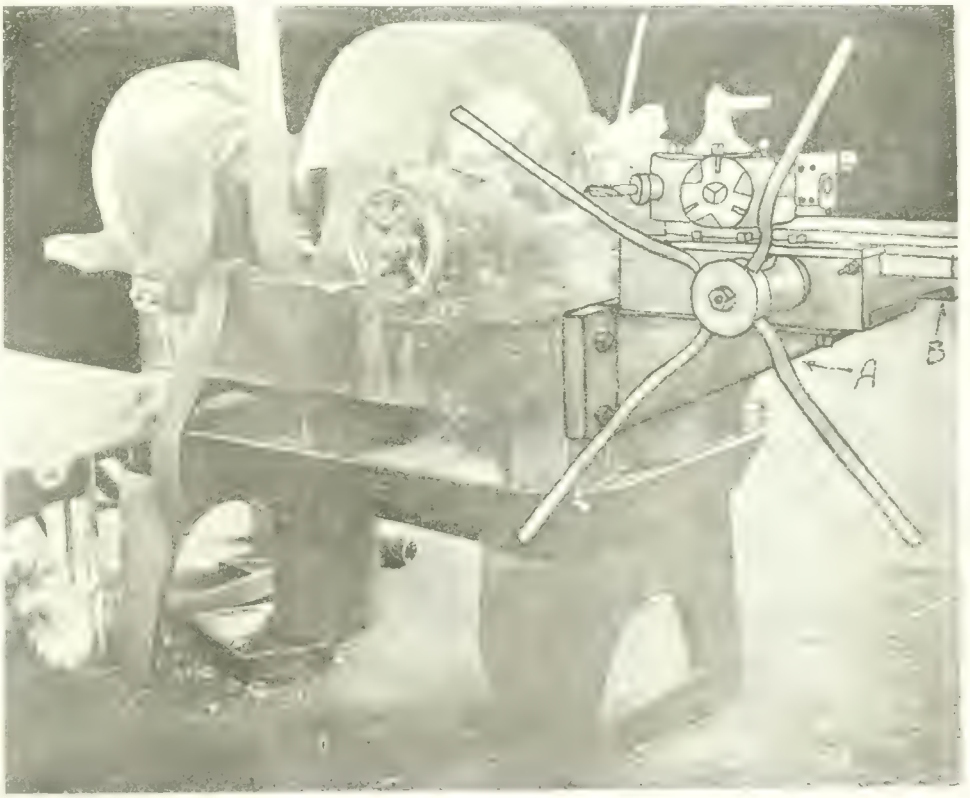
At the extreme end of the cut-off bed, a bracket, A, was fastened. Both the method of securing and its construction are plainly shown on photograph. Not only was this bracket bolted by good substantial cap screws, but after being lined up in place, ⅝ in. dowels were used as an extra precaution.

On top of this bracket was fastened the slide casting B. Its construction is exceedingly simple, as can be seen on photograph. This piece was also secured by dowels before completion. The turret slide was an old one they had on hand, and by going over the same to see as to its accuracy, they soon had a turret lathe capable of taking up to 4 in. bar stock, for the hole through the spindle is of sufficient size to accommodate 4 in. stock. The rest of machine is of similar size and rigidity, being well braced with solid ribs.

As for the tool equipment on this lathe, these points are not touched upon, because the tooling on such a machine depends entirely on the class of work being done.

The firm who so ingeniously converted this cut-off machine into a regular turret lathe, is the Globe Engineering Company of Hamilton, Canada, and their superintendent, J. Gough, who allowed the writer to photograph the machine, is directly responsible for the idea of thus licking the shell game cast-off into a regular production machine tool.

Sault Ste. Marie.—The Soo locks are ready for any vessels that may care to pass their way. Painting and repairs to the locks are completed. The lakes are now wholly free of ice, and ice which remains in St. Mary's River is not so heavy as to cause trouble to a freighter. A Canadian tug made a trip from the Soo into Little Lake George through the old ship channel and is the first steam vessel to venture out this year. If there is any request the canals will open at once. This would be the earliest opening of the Soo locks since they were established. The earliest date of opening was in 1902 when the first vessel went through on April 1. The new fourth lock will not open at once. Delay in arrival of certain machinery may postpone the fourth lock opening until early in July. The gates are being erected



GENERAL VIEW OF ONTARIO MACHINE

Some Interesting Brass Cock Operations

An Article Describing Two Interesting Operations, in the Manufacture of Brass Cocks, as Practised in a Well-known Canadian Plant Where Such Goods Are Manufactured

By J. H. M.

IN these days of modern production methods, speed, combined with good workmanship, is a necessity, and the two operations illustrated in the following article are examples of such a condition. The views were both taken in the plant of the Canadian Brass Co., Ltd., of Galt, Canada, where a full line of waterworks, gas companies, and plumbers' brass goods are manufactured.

Hexagon Milling Fixture

Fig. 1, the first of the views, illustrates the operation of milling the hexagon portion on brass stop cocks of the usual standard design. Referring to the view, we see that one of the operator's hands is on wheel, which feeds the work in and out, while the other hand is in a still lower position, grasping lever B, which operates the mechanism spacing the hexagon location attachment. Briefly the action is as follows:

The work is first placed between the stand "C" and screw, with suitable cap "D," operated in turn from handwheel "E." The stop cork is placed so that it points square with the milling end cutter, and the stand "C" is raised or lowered until the portion to be milled is in line with the centre of the cutter. Of course, when once this height is set up, a large number of similar size cocks are run through at such position, but to change this height is only a matter a moment.

The work is fed in at a good rate of speed by the wheel "A," and returned as soon as milled. The lever "B," is now operated by the workman, which causes the cock to revolve until the next two edges to be milled come into position, and the same procedure is gone through once more. The telling of the operation in reality takes longer than the actual work, for the operator becomes so accustomed to the operation that he moves the various wheels and lever automatically. Such an idea as this need not be confined to the manufacture of brass goods only, but by adopting the same basic principle, other classes of work could be machined in such a manner to good advantage.

Oscillating Cock Grinder

The second and last operation shown in this article is that of grinding into place the key of cock into its seat. The work is done on machine, as shown in photograph, Fig. 2, which is so geared annd costructed at the back that an oscillating motion is obtained. A glance at the photograph clearly illustrates how this movement is obtained. The key itself is held in the chuck, while the operator, who has now started the machine, places, with a brush, some fine liquid emery paste on the stem. He then takes the body of the cock, and with a slight backward and forward movement grinds the two into place, the oscillating movement of the machine helping considerably in preventing the two pieces seizing together. After the cocks are finally completed they are tested under 150 lbs. water pressure. While no photograph of this testing apparatus was taken, still a general description might not be amiss for the reader's benefit.

The work is placed over a nozzle at the bottom end, and a screw with a covering cap is tightened by means of a handwheel down on the top. The pressure is now turned on when water comes up through the bottom nozzle and is balanced by a valve until 150 lbs. has been reached. Any leaks will, of course, be sure to show up at such a pressure, but as the manager of the concern mentioned to the representative of CANADIAN MACHINERY, the red brass as used for all this work seldom shows any flaws.

FIG. 1. HEXAGON MILLING OPERATION

FIG. 2. GRINDING THE COCK

WELDING AND CUTTING

WINFIELD ELECTRIC WELDING MACHINES

OUR illustrations show four products of the Winfield Electric Welding Machine Co. of Warren, Ohio, and a brief description is here given of each.

Fig. 1 shows the S48 sliding horn spot welder, which can be operated both by hand and foot power. It has a capacity of two ¼-inch plates, the overhang of the jaws being 4 feet. The greatest opening between electrodes is 3 inches. The distance between copper bands and the lower horn when the lower horn is at the top of its slide is six inches, and when the horn is at the bottom of its slide and the box post clamped to it, the distance is 26 inches. The dimensions of the lower horn are 2½ in. by 3 in., and the height from the floor to the centre of the welding points 42 in. The base is 26 in. x 42 in., the extreme height 66 in., while weight is about 3,000 lbs.

The equipment that accompanies the machine includes a 35 kw. transformer, enclosed auxiliary switch, which operates remote control switch, either automatically or not, as the operator desires. Three sets of 1¼ in. point caps, a swivel head, removable swivel foot lever, stop for regulating travel of upper electrode and foot treadle, wrench for adjusting the electrodes, and a ten-step self-contained regulator for controlling current.

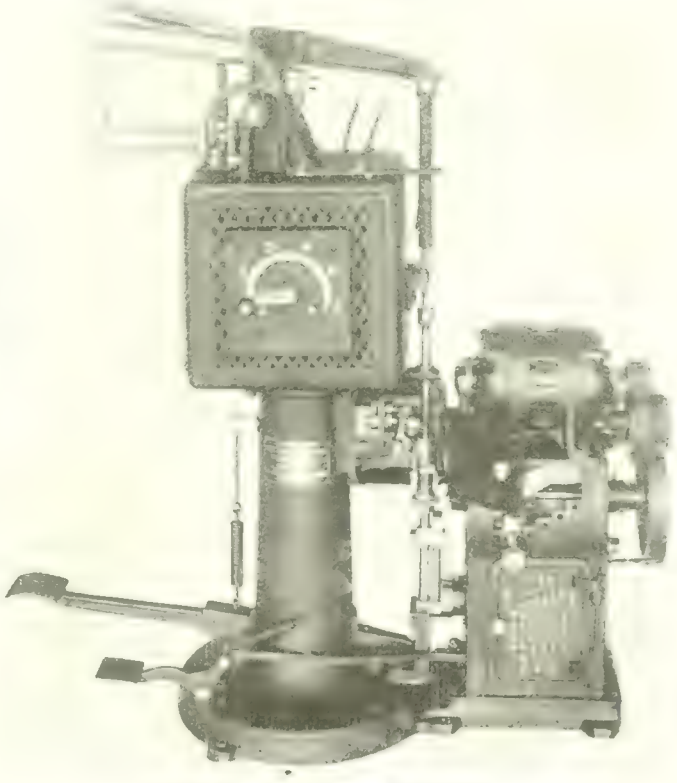
Fig. 2 is known as the B-10 No. 35 butt welder. This machine has a capacity of ½ in. to 1½ in. round stock, or stock of an equivalent cross-section. The transformer is 50 kw. capacity and the machine is equipped with LO step current regulator for adjusting the current, and water-cooled terminals. Back stops are provided to prevent the work from slipping, a hand toggle lever for upsetting work, and stops to regulate the amount of take-up in each weld.

Fig. 3 shows a B-13 butt welding machine designed especially for welding flat stock, capacity 9-16 in. x 4 in. flat stock. The floor space occupied is 60 x 36 inches, with an extreme height of 60 inches. The height from the floor to centre of the welding dies is 41 inches.

The transformer on this machine is of 75 kw. capacity. For compressing the stock a 5-ton double-action hydraulic ram is fitted. The upsetting lever carries an auxiliary switch which operates a remote control switch. There is one set of water-cooled welding dies and a ten-step self-contained regulator for controlling the current. Fig. 4 shows a regular S-6-M regulator motor-driven spot welder. In the illustration the switch door is shown open. It can be operated either automatically by small clutch treadle or non-automatically by large treadle. The capacity is two ⅛-inch plates, the overhang being 6 inches. The greatest opening between the electrodes is 1½ inches. The distance between horns closed is 4 inches, and the diameter of horns, 2 inches. The height from floor to centre of welding points is 43 inches, floor space 19 by 30 inches, with an extreme height of 48 inches. The machine weighs about 500 pounds.

The electric equipment includes a 10 kw. transformer and enclosed automatic switch with door and removable cover. One ½ h.p. Crocker-Wheeler constant speed a.c. motor with noiseless raw hide gears. The gear box carries gears which give six changes of speed. There are the necessary wrenches for adjusting the switch and electrodes, three sets of

FIG. 2 BUTT WELDER



MOTOR DRIVEN SPOT WELDER

water-cooled point caps, and a large removable treadle for operating machine non-automatically. A stop is provided for regulating travel of upper electrode

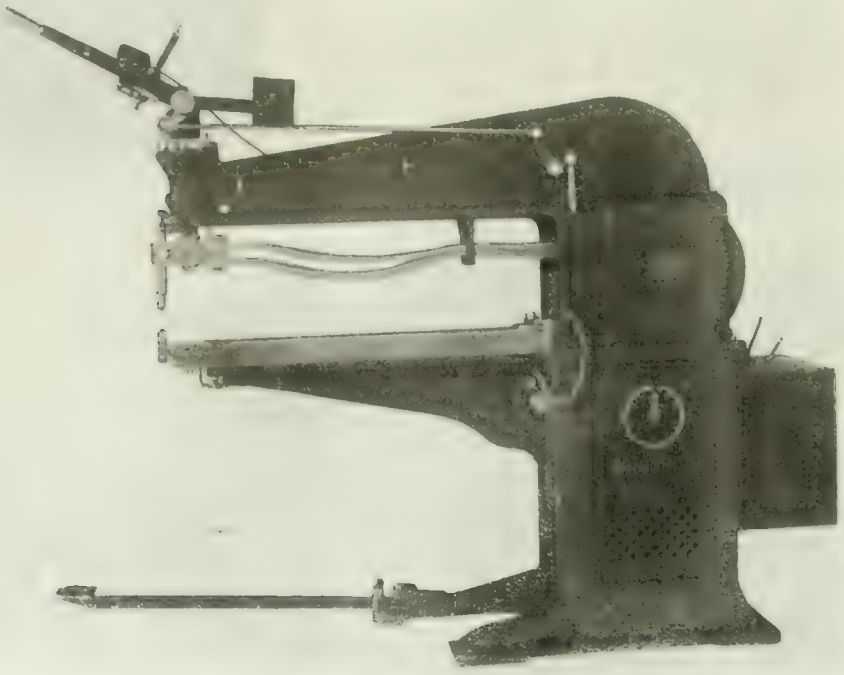


FIG. 1 SLIDING HORN SPOT WELDER

and treadle, and six-step self-contained regulator for controlling current.

Another size of this machine is known as S-6-L, and has a capacity of 1-16 in. stock. It is furnished with a 7½ kw. transformer. Both the S-6-L and S-6-M machines can be furnished with sliding horn and belt-driven attachment if desired.

NOTES ON OXY-ACETYLENE WELDING

For brass, of which there are many variations, a welding-rod of new metal of the same composition approximately as the article to be dealt with, having a very small quantity of aluminum added after casting, should be used. This introduction of aluminum prevents the volatilization of the zinc, and to prevent oxidation and to dissolve the alumina, the flux used for copper is indispensable.

To weld, to merit the description autogenous, must be the result of fusing the metal of the two pieces to be welded, and the metal to be added to fill the V; so the operator must manipulate the flame in such a manner that the two bevelled edges receive equal heat and become molten at the same time as he drops some molten metal from the rod, and proceeds along the line of the weld, in a succession of little molten baths.

The commonest defects in welds are "adhesion," "oxidation," and blow-holes." "Adhesion" means that the added metal has been dropped into the V before the bevelled edges are properly molten, and has merely "stuck" instead of being welded in. Welds in ductile metal, such as iron and steel, are improved by hammering and afterwards annealing, providing the hammering is not done below a temperature of 800 degs. C. or thereabouts.

The scope of the oxy-acetylene welding process is wide, and its possibilities have not yet been realized and exploited to the fullest extent. Many manufacturers are, however, making use of it not only on repairs, but on new work, such as barrels, tubes, and tanks, in which the seams are welded instead of being riveted, and framework of all kinds, such as carriers and stands for motor-cycles. Repairs are effected on work of a very varying character, ranging in size from small carburettor details, to large ships' rudders and propellers.

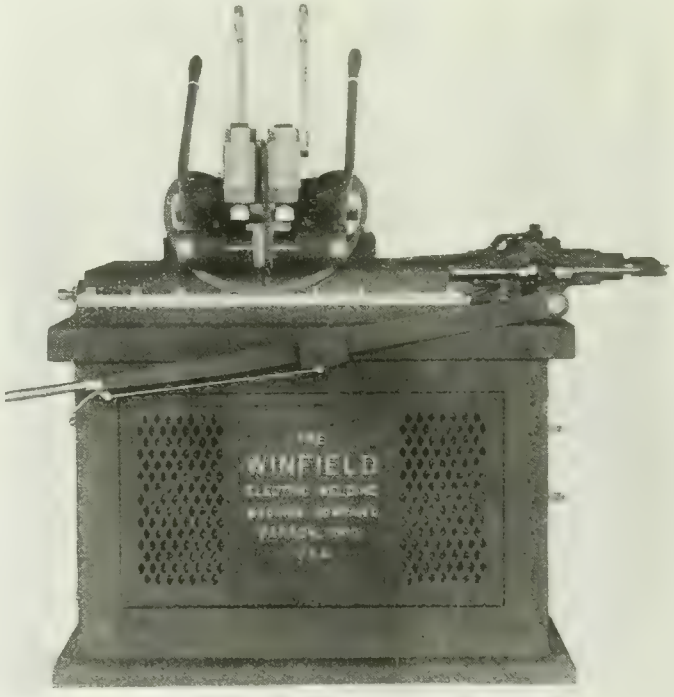


FIG. 3 BUTT WELDER FOR FLAT STOCK.

ARITHMETIC COURSE

(Continued from page 349)

For a one inch micrometer the axial line on the barrel is divided into 10 equal divisions, each of which is subdivided into four others, so that one of the latter equals the pitch of the enclosed operating screw. As the thimble is rigidly connected to the spindle, it is evident that one complete turn of the thimble advances or retards the spindle 1-40 of an inch. Means are provided, however, to obtain finer measurements, by graduating the end of the thimble, to indicate the advance for a portion of a revolution. These divisions will represent a lateral change of .001 inch. When reading a micrometer remember that each main division represents 4-40 or 1-10 inch, the decimal equivalent being 1, and the subdivisions would be 1-4, 2-4 and 3-4 of one of the main divisions. The reading on the barrel of the above setting is:

$$.7 + \left(\tfrac{2}{4} \text{ of } .1\right) = .7 + .05 = .75$$

and the graduation of the thimble, coinciding with the axial line on the barrel, is 12, and as each division equals .001, the reading would be:

$$.75 + .012 = .762$$

Ordered Drags.—J. G. Cameron, road superintendent for the United Counties of Stormont, Dundas and Glengarry, has ordered 20 road drags from the Ontario Bridge Co., Ltd., of Toronto.

WHAT OUR READERS THINK AND DO

GRINDING A MASTER HOB

By J. H. M.

THE following article is presented in this section of CANADIAN MACHINERY with a double purpose in view, the first being to answer a query sent in by J. Davis of Oshawa relative to this subject, and secondly, that all readers can follow the description of procedure as mentioned herewith, writing their views on the subject should they have another or better method of accomplishing this required operation.

Fig. 1 illustrates an exact duplicate of the sketch as sent in by Mr. Davis, and following are the exact words as written to us in his letter: "Here is a problem that has given us considerable trouble. How would you grind correctly the master hob shown on sketch? The hob is as near perfect as it can be made, in lead or pitch, depth of thread, angle of thread 60 degrees, and taper Briggs Standard. It is to be used for making special taps, and must not show more than .001 inch error in any direction after it is ground."

To begin with, the writer of this article referred to Machinery Handbook, Page 1061, and found that the nearest size pipe hob for similar work, conformed to the sketch shown on Fig. 2. A hob of this nature should not be so difficult to make, provided the machinery and hardening operations have been carried out with care. It will be noticed that slight differences of diameter and length are shown between the engineer's hob and that mentioned in the Handbook, but the taper, which is after all the main feature, is the same in both cases, namely, ¾ in. to the foot. It will be particularly noticeable that 26 flutes are suggested instead of ten as used by Mr. Davis. This is a significant point.

In the writer's opinion the best method of doing this work would be on a regular cutter and reamer universal grinder, but should this not be possible in the particular case in point, the work could then be done on the lathe, making sure a face plate is used, with dog to hold the work, or rather the mandrel supporting the work.

The reason for this method of grinding is of course self-evident, namely in order to ensure that both centres are dead centres, similar to any grinding machine. If this is not done, naturally the work has not the same chance of accuracy.

A portable grinder of good design can then be mounted on the lathe, making sure it is set to the proper angle of ¾ in. to the foot, and that the wheel is properly dressed. It is imperative that the wheel be correctly dressed, other wise no good accurate work can be accomplished. Taking it for granted that the work is set up as suggested, traverse the wheel over the work in the usual manner.

Other points which Machinery Handbook mentioned particularly, are as follows: that all taps must be relieved both on the top and in the angle of the thread, also that usually the flutes of these hobs are cut with a 50 degree single angle cutter.

The writer will conclude by quoting the experience on a similar hob, which a friend of his passed through. This particular party was superintendent in a well-known machine plant, where the custom was to order their hobs [illegible] later made. After being thus changed they worked splendidly. The material these hobs were cutting was high grade carbon steel.

And now to the readers. Have you [illegible] overcome it? Exchange of ideas is well worth while, so let us hear from you.

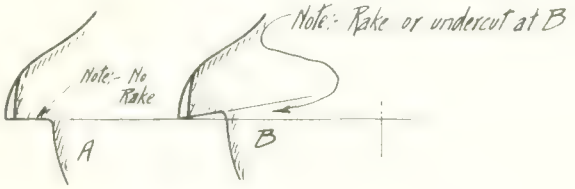


FIG. 3

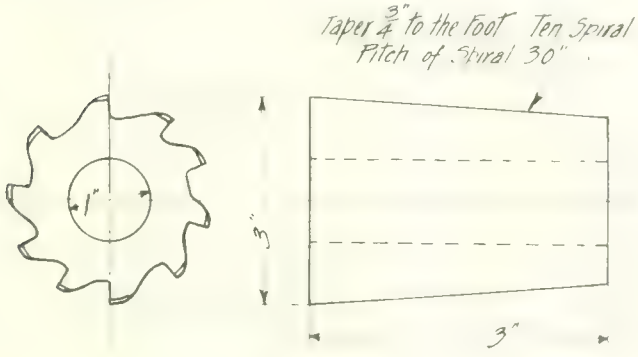


FIG. 1.

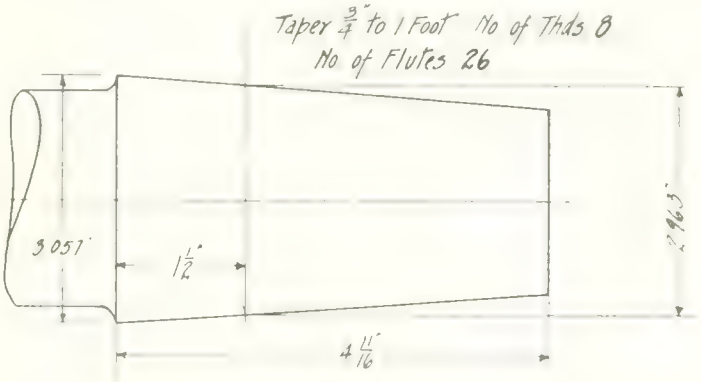


FIG 2

AN IMPROVISED SOFT FACE HAMMER.*

By Leon A. Prescott

When it is necessary to pound certain metals such as brass, nickeled or finished work it is desirable to use a hammer which will not damage or mar the surface. Such a tool is called a "soft face" hammer. Hammers with babbitt-metal hears are regularly manufactured for this purpose and are very convenient. But an impromptu tool can be assembled easily as suggested in the illustration. First a piece of leather belting is cut as shown at A. Then this strip of leather is arranged on the hammer head as suggested at B. The hole, H, must be large enough so that the hammer handle will slip through it. The leather protective strip is fastened by driving a tack through the position T into the wooden handle. When pounding on objects that should not be marred, the blow is delivered with the side of the hammer head, which is protected with the leather.

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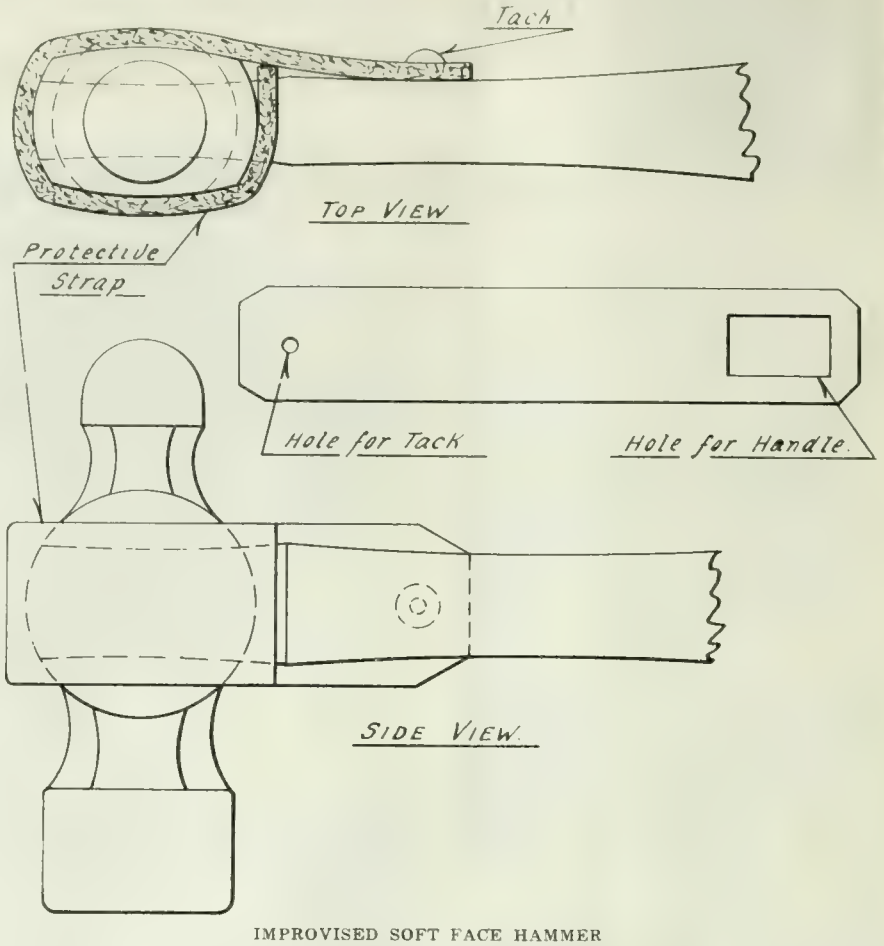


IMPROVISED SOFT FACE HAMMER

TO STRENGTHEN AN AXLE BY REMOVING METAL

By A. J. GRAY

We are having continuous trouble with the axle of a logging car. The axle apparently gradually fatigued and broke off on the outside of the bearing close to the collar, as shown in Figure 1.

The roadway is not as smooth as might be, and the continual pound had a hammering effect that caused the break, in spite of the fact that the axle had a more than sufficient factor of safety to take care of all the dead load.

The trouble was remedied by tapering the axle to the centre, as shown in Figure 2.

The explanation of the fact of removing the metal from the centre of the axle having a strengthening effect, is found when it is understood that the reason for failure was the hammering on the axle caused by the poor road-bed. The force tending to cause fracture would be the foot-pounds of energy that has to be absorbed at the neck of the axle where the break occurred.

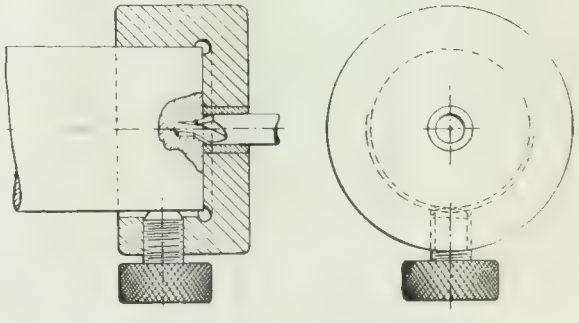
Energy is a combination of two factors. That is, eneregy = force × space. It will follow that the greater the space moved through, the less will be the force of resistance caused in absorbing the energy.

This explains the fact of the axle as made to Figure 2, being the strongest, as in giving slightly at the centre it allows more give at the neck, which is equivalent to a greater space moved through to absorb the same amount of energy of the pounding, thus producing less strain in the metal axle.

Incorporation has been granted to the H. M. Lane Co. to carry on the business of general consulting engineering, designing and construction work; and the manufacture, sale and installation of all kinds of machinery and manufacturing equipment. Capital is $10,000, and the head office and place of business of the company is to be at Windsor, Ont.

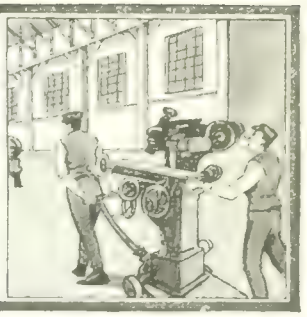
A CENTERING CAP

THE suggestion offered in the block is an improvement on the ordinary centering cap, bored out to a complete circle, to slip over the end of a shaft, spindle, boss, or other round piece. The objection to a complete circular fit is that it offers no latitude for burrs on the work, slight variations in diameter, lumps or other irregularities in castings or forgings. Therefore, the design is modified as illustrated, a little less than half the interior of the cap being left



to fit the work, the remainder of the circle being milled out a little larger. —Fred Horner.

DEVELOPMENTS IN SHOP EQUIPMENT



NEW BENCH SAW

THE illustration shows a new bench saw recently developed by J. D. Wallace & Co., 1405 N. Jackson Boulevard, Chicago, This machine eliminates much of the waste of time occasioned by the running to and from stationary machines.

As the name implies the Wallace Bench Saw is a bench tool portable and designed to operate on the electric lighting current, yet it has ample power to take a full two-inch cut through the hardest of wood, making it possible to use this machine for 80 per cent. at least of the sawing usually done.

This machine overcomes the disadvantages of other designs. To cut at an angle the saw is tilted instead of cocking up a heavy table. The illustration shows the saw tilted to a 45 degree angle. This, as will be realized, makes it possible to cut long stock without fear of breaking the angle by the stock coming in contact with the floor, as is so often experienced when attempting to cut long stock on a table tilting machine. Other advantages accruing from this saw tilting design are, first: the operator is working on a table which is always in a horizontal, efficient and safe position; second: the exact angle of cut is set without much difficulty by simply spinning the hand wheel until the angle desired is registered on the dial in the front of the machine; third: no time is wasted adjusting the machine, for, as is often the experience when attempting to set a table tilting machine, the heavy table drops a few degrees before the screw is tightened, making it necessary to do the work over again, or if the drop goes unnoticed the cut is taken and the stock either spoiled or the job must be done over.

This tilting mechanism is controlled by a hand wheel mounted on a perfectly cut screw acting on a swiveled nut. This swings the cradle in which the motor-driving mechanism and saw are mounted. While it is very easy to make this adjustment, the screw holds the cradle rigidly.

The saw can be raised and lowered so as to cut or groove the stock any depth up to 2 inches. The raising and lowering mechanism is similar to the tilting mechanism and is controlled by a hand wheel in the front of the machine.

The crosscut fence is built into the machine but can be thrown under the table when not in use. It is, however, never off of the machine and lost.

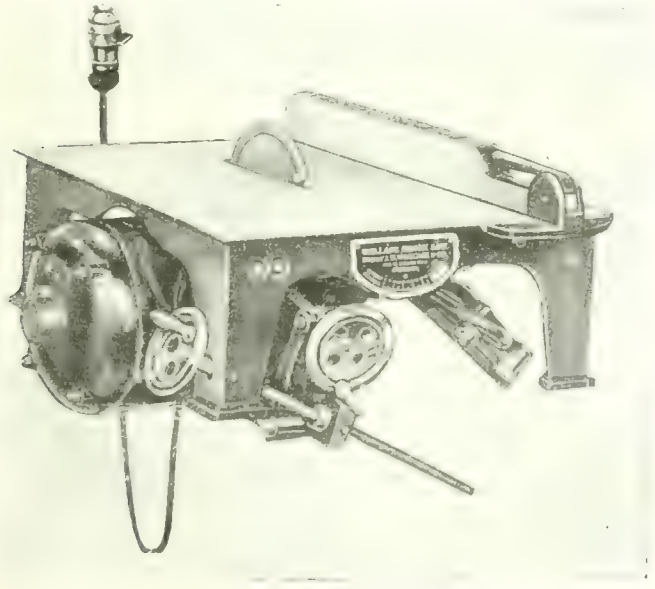
The rip fence is finished on both sides so that it can be used on either side of the saw. This fence is of box type and is clamped to both sides of the table by means of a handle conveniently located. This handle works on an eccentric and locks by going over the centre of the eccentric.

The shutter saw guard is a great factor in increasing the efficiency and cutting expenses with this saw. This saw guard is built into the machine, and for that reason is always on guard. It slips back as the stock goes through and is so designed that it never interferes with the efficient operation of the saw.

It not only protects the operator's hands, but prevents two other causes for accidents, whench cause more losses than actual cutting, that of catching the tail end of the stock in the back of the saw or catching the waste stock in the teeth of the saw and having it shoot into the abdomen of the operator. The saw guard eliminates all three causes and for that reason saves time and damages.

TAPER ATTACHMENT FOR SUNSTRAND LATHE

The Rockford Tool Co., Harrison Ave., Rockford, Ill., have developed a taper attachment for use with their Sunstrand lathe. The lathe was recently described in CANADIAN MACHINERY and the taper attachment illustrated has some novel features of interest, chief among which is the fact that it is located on the front of the lathe instead of the rear, as is more usually the custom. Another important feature has to do with the method of attaching the taper device. Only three screws are necessary, and if the owner desires to buy the taper attachment for a lathe already in his shop, no fitting or machining are necessary to secure it in place. Too often these screws



NEW BENCH SAW

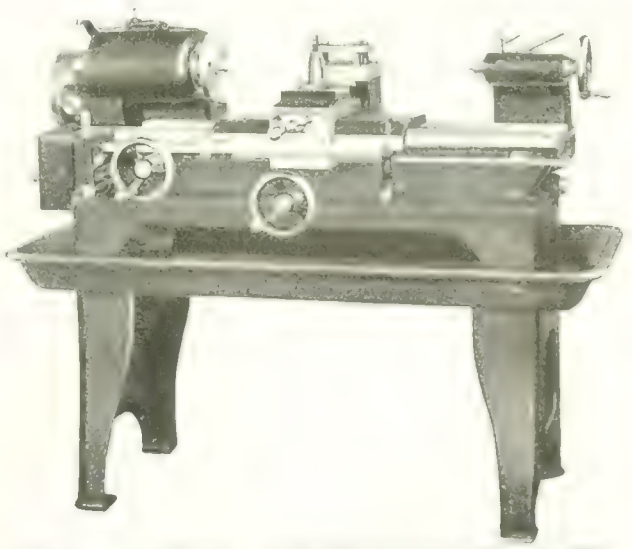


FIG. 1 LUNSTRAND LATHE EQUIPPED WITH TAPER

will be noticed on the block forming the front of the attachment, and the other is at the right hand end of the bed, where the bracket is attached. The attachment is made with graduations to indicate

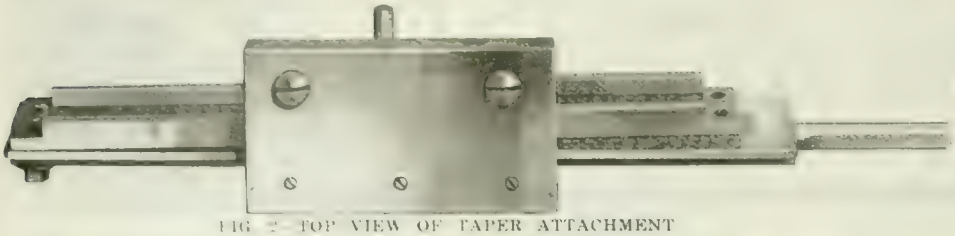


FIG. 2—TOP VIEW OF TAPER ATTACHMENT

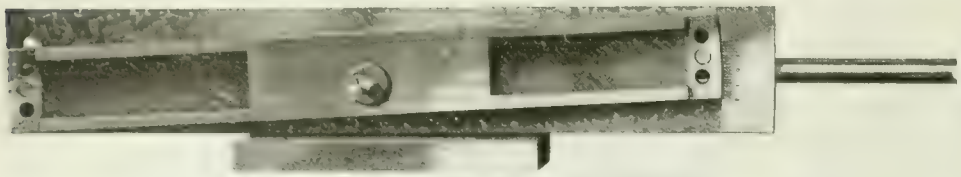


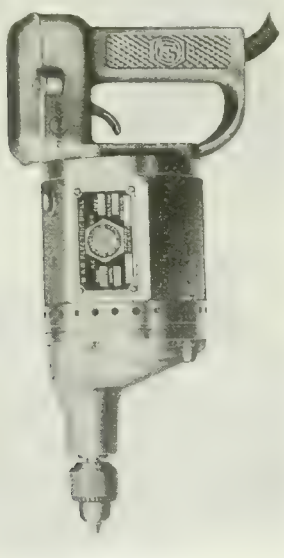
FIG. 3—SIDE VIEW OF TAPER ATTACHMENT

tapers in either degrees or in inches per foot, and is provided with a sliding block running in a bearing, which may be set at any desired angle.

NEW PORTABLE ELECTRIC DRILLS

The Black & Decker Mfg. Co., Baltimore, Md., have recently placed on the market two new models: a 3/16-in. and a ¼-in. portable electric drill "with the pistol grip and trigger switch." This patented feature has heretofore been obtainable only in the larger sizes.

These two models are one-hand drills, which is made possible by the pistol grip and trigger switch. This makes it possible to handle the tool like an automatic pistol, the current being controlled by



PORTABLE DRILL

pulling the trigger without the necessity for changing the position of the hand holding the drill. In addition to the advantage of convenience, this control saves the breakage of drill bits so often caused by the drill sagging on the bit when the operator changes the position of his hands to switch off the current.

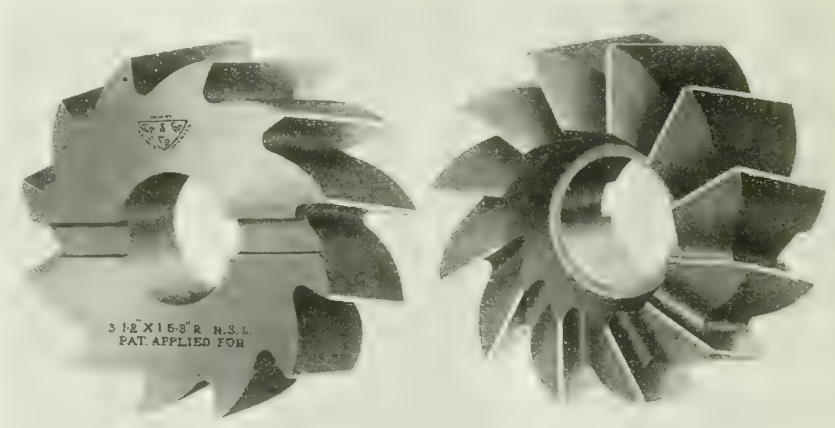
These two models have 1/6 horse-power motors with series compensated windings, and operate on any current from direct to 60 cycle alternating. Cooling is by means of a vane impeller mounted on the armature shaft, which causes a forced circulation of air all through the housing. Gears run in grease in a grease tight compartment like an automobile transmission.

No load speed of the 3/16-in. drill is 1600 R.P.M., energy consumption 175 watts.

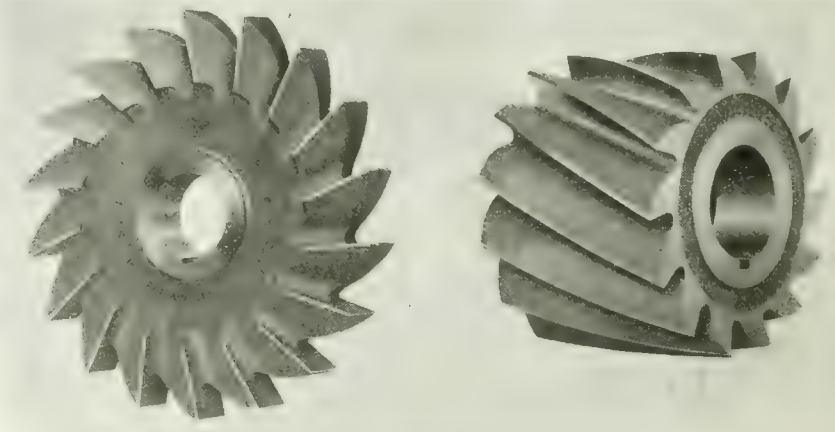
No load speed of the ¼-in. drill is 1200 R.P.M., energy consumption 175 watts.

NEW TYPE-MILLING CUTTER

The Goddard & Goddard Co., 39-45 West Congress St., Detroit, Mich., has recently brought out an improved type of profile milling cutter, the special features of which may be readily seen from the accompanying illustrations. The style of tooth adopted (for which patent is pending) is the result of careful study and experiment and embodies that most desirable combination of maximum strength of tooth with maximum clearance for chips. The well recognized value of the shearing action versus a scraping action is incorporated in the undercut tooth as in contradistinction to the radial tooth. A much increased angle of spiral has also been adopted. The combined result of the above noted features is a smooth action under heavy cuts, freedom from clatter and ability to deliver maximum production with minimum consumption of power. Attention has also been paid to the distribution of metal in these cutters so as to deliver the last ounce of service. Note the deep-seated recess in the shell end mills, this allowing several recuttings of end teeth. Note the extra thickness of web in the side mill, also the extra long side teeth, thus allowing several recuttings as the peripheral teeth wear down.



G AND G MILLING CUTTERS



NEW TYPE MILLING CUTTERS

This Firm Helps Circulate Information

At Ingersoll-Rand Co., Sherbrooke, Que., a Well-Run System is Used to Get the Worth-While Material Before the Men Who Desire to Read It—Demand For the Material

SOME of the industrial concerns in Canada are paying considerable attention to the filing of articles taken from technical papers and books, which might be of use to their men. Some of them have regular circulating libraries, and the articles are all listed and stored away so that they can be secured at any time. One plant in Canada that pays considerable attention to this work is the Canadian Ingersoll-Rand Co., Ltd., of Sherbrooke, Que.

For a long time they have been circulating the various journals that come in around the shop, and find that this service is appreciated. However, some of the journals take a very long time to find their way around the circle, and do not always reach the publicity department again. Then they were finding themselves too much burdened with piles of old journals which were seldom consulted.

To remedy this they went through the files of their journals, CANADIAN MACHINERY, "Canadian Engineer," "American Machinist," "Power House," etc., removing articles of greater interest.

These were placed in cardboard folders, arranged by subjects. They then threw out the old journals, except one or two which were requested to be kept on file. The lists of articles were then mimeographed and sent out, both to the shop and sales, with a request that these lists be kept on file, and that when articles were wanted they should be specified by number, say, "Compressors No. 5," or "Mining No. 15." In order to keep a check on the whereabout of the articles a card-index is kept with the names of the borrowers, what they have, and the dates of giving out and return.

In order to have a cross-check, cards with the name of the borrower are slipped in the place of the folder going out, so that if a folder comes in with no indication of who sent it, the card shows. The lists are being added to continually, and revised lists issued from time to time. When articles are taken from current journals before these are sent on circulation, a note is made in the index to the effect that the articles are to be had on application to the Publicity Department.

It may be thought that such a file is of little value, but judging from the fact that the foundry foreman has six of the "Foundry" series out at present, that the company have requests from the draughting offices, and from more than one of the sales offices, there seems to be some value in having information on hand.

The Circulated Lists

The following will give an idea of the manner in which lists are prepared. We are reproducing only the first nine items on each list, simply to show the range of subjects that are dealt with. Some of the lists are already past the 50 mark, and it looks as though the Ingersoll-Rand Publicity Department had a complete method of looking after this work.

General

1. The World's Largest Bridges.
2. What it Pays to Know About Factory Lighting.
3. Increasing the Output in Great Britain.
4. The 20 Men Behind the Lines.
5. Practical Training of Apprentices.
6. Standard Specifications for Babbitt Metals.
7. Fundamentals of Beam Theory.
8. Fundamentals of Apprenticeship.
9. Duty Trials on Pumping Station in Toronto.

Draughting and Design

1. Draughting Room Versus Shop.
2. Draughting Room Etiquette.
3. A Plea for the Poor Draughtsman.
4. Representation of Screw Threads and Dimensioning.
5. Conversion Table; Inches and Millimetres.
6. The Solution of Equations Higher Than Quadratic.
7. Critical Speeds of Rotors Resting on Two Bearings.
8. Critical Speeds of Rotors Resting on Three Bearings.
9. Drawing Room System in the Engineering Department.

Forge Shop and Foundry

1. The Sand Blast in the Modern Foundry.
2. Heat Treatment of Steel.
3. Factors in the Heat Treatment of Steel.
4. Heating Treating Furnace with Oil Fuel Equipment.
5. How Marine Cylinders Are Moulded and Cast.
6. Electric Steel Furnace Development.
7. Forging Machine Die Design.
8. The Types and Uses of Industrial Pyrometers.
9. Pattern Match Plates.

Electrical

1. Practical Talks on Controllers.
2. Motors Operated Under Modified Conditions.
3. Distribution Loss Factors.
4. Transient Conditions in Induction Motors.
5. Principles of Phase Converter.
6. Balance on Three-wire System.
7. Electrical Machine Bearings.
8. Synchronous Motor Starting.
9. Specifications for Electric Motor Application.

Machine Shop Practice

1. Tip-it Welding Process.
2. Composition and Properties of Steels.
3. The Ferro-alloys.
4. Causes of Defects in Steel Ingots.
5. Sand-blast Equipment.
6. Checking Angles With Swedish Blocks.
7. Practical Points in Flat Gauge Making.
8. Elements of Gauge Making.

Engines, Pumps, Boilers, Fuel

1. Some Recent Developments in Air Pump Design.
2. Large Steam Turbines.
3. The How and Why of the Beyer Condenser.
4. Design of Turbine Pumps.
5. Two New Nordberg Engines.
6. Steam Costs in 6,600 H.P. Boiler Plant.
7. American Uniflow Engine.
8. Pyrometer Construction and Repair.
9. Review of the Steam Engine.

Compressors

1. Efficiency of Compressed Air Installations.
2. Caring for the Air Compressor.
3. Cost of Steam-driven Air Compressor Plant.
4. The Hydraulic Air Compressor at Cobalt.
5. Air Compressors as Vacuum Pumps.
6. The Efficiency of An Air Compressor in Mine Operations.
7. Increasing the Efficiency of Air Compresors.
8. Blowing Engines.
9. Graphic Air Compressor Calculations.

Compressed Air; General

1. Development of the Pneumatic Sand Blast.
2. Compressed Air in a Modern Tannery.
3. Hand Drills in Structural Work.
4. Compressed Air for Forge Shops.
5. Sand-blast Conditions for Efficiency.
6. Compressed Air in the Foundry.
7. Compressed Air in the Cotton Industry.
8. Air Lift Efficiency.
9. Uses of Compressed Air in the Modern Shop.

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Price Fixing a Failure

PRICE fixing, no doubt, served a splendid purpose during the period of the war. In a good many cases it served to nip in the bud quite a collection of traders who might otherwise have passed into history bearing on them the tag, "war profiteers."

But now that the war is over, price fixing is not popular. It has been tried out in steel and iron.

Steel kings have stuck together, and as they have viewed with alarm the prospects of too much grease getting on the price skids, they have gathered together and chanted a verse or two on "Steady Now, Boy."

And after this is over they come forth with a new list of prices. Of course, they would not care to seize the phrase the labor men make use of and announce that the new figures they are about to chalk up amount to an "irreducible minimum," but it's much the same thing, even if wheeled out from mahogany surroundings.

Purchasing agents and buyers on a large scale do not like a fixed market. They know that manufacturing costs are not the same at all places, and that while $3 may represent a very small margin of profit for one man, it means a big, juicy dividend for another. The buyer prefers to go into the open, untrammelled market, or send out his specifications for tender. It is as plain as day that he does not like the "fixed" market, and the paucity of his buying is proof positive of this fact.

Director-General Hines of the U.S. Railroad Board refuses point-blank to have anything to do with the fixed prices. He apparently has it figured out that sooner or later he will be called upon to hand back the roads to those who own them, and he is not going to take the chance of wishing on these lines a great big expenditure at prices higher than those which would prevail in an ordinary competitive market.

As far as this man Hines is concerned, he has simply taken the price-tinkering arrangement and led it to the back door of the railroad premises. The roads were looked upon as good for $1,500,000 worth of steel orders, but they have not bought a pound, and Hines says very plainly that they do not intend to, and it is hard to see where there is any properly constituted power that can force him to come down from his high level. And as long as the nation's biggest buyer stays out of the market the smaller buyers are not at all likely to rush in.

If there is not a great deal more business moving at the new prices than at the old, steel mills stand to lose. It is plain that there is nothing but loss for them in coming from 3c per pound to 2.65 if the same volume of business is handled.

It is becoming plainer every week that purchasers do not like price "fixing" in peace times. They much prefer the old competitive market, where a good-sized order was certain to bring in the very best offers that producers could get. The fact that large buyers of iron and steel are staying out of the market is about the best possible evidence of their disapproval of a prearranged schedule of prices.

This Man is Worth More

OTTAWA has a new way of making appointments, and also of securing applicants for positions that are opening up there. In the good old days the members of the House had a list of the boys who had been faithful during elections. Those who had driven rigs, posted bills, dodged up the back lanes and up the alleys were all remembered. They would not have been good party men for many years had they not received recognition.

For some unknown reason it used to be considered one of the greatest things in the world to get on the Government pay roll. The impression was abroad in the land that it was a good thing, rather easy work, and quite removed from the atmosphere of a sweatshop. And although the wages were never very high, there were always plenty of applicants for every little Government job that turned up. A man who received an appointment that was worth a couple of thousand was indeed quite favored.

But now they advertise for the men that are wanted in the civil service. Here is a sample of one of the better appointments that is opening up now:

> THE Civil Service Commission of Canada hereby give public notice that applications will be received from persons qualified to fill the following position in the Civil Service of Canada:—
>
> **A Commissioner of Immigration—Salary $2,500 per Annum**
>
> 1. A Commissioner of Immigration for the Western District, Department of Immigration and Colonization, at a salary of $2,500 per annum. The office of the Commissioner shall be in Winnipeg. The appointee must be capable of assuming responsibility for the direction, control and supervision of all immigration employees within his territory and for the transaction of all official business arising from the Immigration Act. Candidates must have a good general education, a knowledge of business, together with executive ability and personality. They should produce credentials as to their general experience and qualifications for the position.

Now, a person who can stand up and meet the requirements in the ad. given does not need to go on the pay roll of the Government at $2,500 per year. He can earn a good deal more working for other concerns.

The publisher of a good, bright weekly paper refused to consider applicants for the position of editor of his paper only a few weeks ago because none of them would ask over two thousand a year.

There are plenty of shop executives, some of them in very humble capacities, that are making more than $2,500 per year. Good draftsmen will get that much money, while there are scores of men on the road who would not be interested in the Government proposition.

The Government can advertise and offer to pay $2,500 a year, but there is nothing to guarantee they will get a man to measure up to the specifications they set forth. They are in reality calling for a $5,000 man, and probably taking a chance that he may be had for half the price.

DEMOBILIZING the army might not be much of a trick if the authorities would let the work proceed. There are a large proportion of the men who could attend to their own demobilization if given half a chance.

THE barbers in Galt are going to charge fifty cents for a hair cut. Does that mean that so many of the Galt Scotch folk have joined the Bolsheviki that the remainder have to make up the deficit in the hair-cutting revenue?

Dollars Wasted in Pipes and Fittings

By T. H. FENNER, Associate Editor Canadian Machinery

INDUSTRIAL plant managers have been brought to a sense of realization of power plant costs during the last two years. The result has been a tightening up of supervision, and a close analysis of fuel, water, maintenance, and wages costs, with an appreciable reduction in these items in many cases.

There is another item which it is more difficult to keep adequate trace of, but which is responsible for many hundreds and even thousands of dollars loss in a year, according to the size of the plant.

Hard to Keep Track Of

The modern factory contains many thousand feet of piping, wrought iron, copper, brass and galvanized, and this piping is being constantly renewed, repaired, or altered. From one to twenty steamfitters and helpers are kept busy on this work, varying with the extent of the buildings, and keeping track of all the material used becomes a matter of great difficulty, unless a very rigid system is in force. This applies to the power plant itself and to all the piping through the factory.

Generally speaking, it is in the smaller plant that the greatest waste of both time and material takes place, owing to want of a proper system, but even in many large plants, where the organization is on a much better basis, the loss, though smaller in proportion to the general expense amounts to large sums in the aggregate.

The Case of the Small Plant

Take the case of a small plant of from 100 to 200 horsepower, which are in the majority in this country. A plant of this kind may employ a steam fitter, or the man in charge of the engine and boiler room will attend to the repairs himself. In this case the element of time does not enter into the question so much as the man is usually employed on a standing wage basis.

There will be piping in a plant of this kind ranging from ⅛ inch diameter to six inch, and fittings for all these sizes. All fittings, pipe, packing and tools will be kept in the engine room, and the man in charge will have complete control of the ordering of material, and the using of it. He will be directly responsible to the manager, who cannot in the nature of things have much idea of the requirements of this department; and has to depend entirely on the engineer's judgment.

In a plant of this kind it is not usual to carry a large stock. As a rule, there will probably be from one to three lengths of each size of pipe up to 2½ in., the larger sizes not being carried, but ordered as required. Fittings for all these sizes will be on hand, and a collection of valves of various kinds. Now the number and variety of fittings would surprise a good many people who have not given the matter much thought.

There are elbows, forty-five degree elbows, tees, crosses, reducing bushings, couplings, unions, flange unions, locknuts, plugs, caps, side outlet elbows, etc. These are made in three different kinds; cast iron, malleable and galvanized, all suitable for different classes of work. Whether the right kind for the particular job is used or not depends on the knowledge of the man doing the job, and the durability of the job depends also on using the correct material.

The stock of these fittings carried on hand also depends on the good sense or otherwise of the man in charge. To be short of some particular fitting when it is badly needed, may result in the shut down of the whole plant, while on the other hand, to carry a large stock means tying up money which could be better used elsewhere. In how many of these small plants could the engineer give a reasonable idea of the stock on hand at any particular moment, without a wild scramble through his stock? Very few it will be found. What usually happens is that he takes a look in the bins when getting some fitting out, and orders a dozen of a few different kinds, to keep up the stock. This results usually in a surplus of the particular variety in most use, and a shortage of most of the others. Then the time comes when a particular fitting is needed, and needed badly. It is not there. The job can't wait, so what happens? Instead of using the cast iron fitting a galvanized fitting of the same size, and costing about 30% more, is taken. If that is not available then a larger one is used, and the difference made up by the use of reducing fittings at each end. This, again, brings up the cost of the material, and if there are several fittings on the job it may easily cost double. The time occupied in doing the job is increased, and even if the man's time does not count, the delay to a department of perhaps 25 to 50 hands is considerable. Then when the job is done, instead of examining the fittings that have been taken down, to see if their usefulness is entirely over, a hundred to one they are thrown into the scrap heap.

Can be Used Elsewhere.

Now, a fitting that may not be of much use on a high pressure steam line would be of use on an exhaust heating line, or a low pressure steam line. The same applies to the pipe. Although one part may be bad, the rest of it might well be used in some other part of the system. There being no check on the material used, or a very inadequate one, a number of fittings and several pieces of pipe are wasted on that one job alone. Now take the case of valves. Here is one of the most prolific sources of waste in most plants. To begin with, it is usual to find every make of valve known to industry represented on the system. This is bad in itself, for if a valve of one make is removed from a line, and another one substituted, there is nearly always a difference in length. This means that the length of pipe has to be pulled together or sprung apart, which entails a straining of fittings, which sooner or later results in another repair job. Again, a valve has a defective spindle. There is no spare spindle on hand, therefore, the whole valve has to be taken out of the line, and another one substituted. This usually entails the taking down of two or three lengths of pipe and fittings before a flange or union is reached. What becomes of the body of the valve, which is perfectly good. Mostly it is thrown in a corner and forgotten, and when another valve gives out on the body part the same procedure is gone through. Now if all valves when taken out of the line were carefully dismounted, and the bonnet, gland nut, and spindle put into separate bins or boxes, a good deal of money could be saved in the course of a year. In addition to this, one make of valve should be determined on as the most suitable, and whenever an old valve is replaced it should be by one of this standard pattern.

A Standardized System

In this way the whole of the system will be gradually standardized. Furthermore, a straightway gate valve should never be employed on a steam line, as it is almost impossible to keep them steam tight. Another source of waste is that of cutting a length of pipe, only to find it too long or too short by a ½ inch when put up. This means it has to be either cut and screwed all over again, or else the springing method so much in favor among steamfitters is resorted to. They get the pipe together, but it is in no condition to take up the normal working stresses, having been considerably strained already. The result is another repair job very shortly.

What About the Large Plant?

If this is all true in the small plant, what about the

large ones, where the extent of the piping system is multiplied many times?

Here the stock is usually carried in a special stock room, and the engineering department makes requisitions on the stock room for the material required. An adequate stock is usually kept on hand, and a card index system is employed which keeps a record of stock drawn and stock on hand. The stock room puts in its own requisitions on the purchasing department to replenish the stock. Even with this it occasionally happens that the stock room clerks allow some particular stock to get too low, and before their order has gone through a demand arises for the particular article that is out of stock. I have seen a whole section of a factory without heat for three days in the middle of winter, for lack of a seven-inch fitting. It is always well for the chief engineer or foreman steamfitter to keep tabs on the stock himself, and remind the stock clerk when anything is getting low.

So far as the stock room goes the the system is all right, and the chances of over or understocking not very great. However, when we come to the requisitioning of stock by the steamfitting department, the same elements of waste arise as in the smaller plant. We will take a case in point. The chief engineer receives a message that a bad blow of steam is occurring in a certain department. He sends a hurry-up call to the steamfitting shop, and a man is despatched to find the trouble. He sees the break, gets the steam shut off and starts in to make repairs. He sends his helper to the pipe shop for some fittings. The ones he wants are not there. There is no time to get an order signed by the chief, so the helper is sent to the stock room for such and such material, for which an order will be returned later. On the steamfitter's time slip will appear so much time, and so much material on this particular job. No record of material saved from the job, or whether the material charged was actually used, or some of it thrown back in the pipe shop, or how much scrapped. The only record is so much material issued from stock and charged up on the job.

Now, supposing some of the fittings have not been actually used on the job, some of the old fittings having been used again. These fittings are, as far as the books are concerned, gone, and their value written off. They may be returned to the pipe shop, or if the job is in an out of the way spot, left lying around. The result of this is that there is an amount of stock lying in the pipe shop which there is no trace of. Now, it is surprising, how much of this stock will find its way out of the gate. In a large factory men are dropping in to the pipe shop every now and again for a half-inch tee, or a two-inch elbow, and as the stock has not to be accounted for they get it. In the course of a year this amounts to a considerable sum.

If a new line is to be put up the same thing occurs. The man who is to do the job figures out what fittings he wants, gets a requisition signed, and receives the material. Anything over goes into the pipe shop, not back to the stock room, and the department is charged for the full amount. The same things occur with regard to valves, etc., as in the small plant, but on a larger scale.

The Remedy

The way to remedy this, in both large and small plants, is simply to check up closer on the material used, and this can be very easily arranged. Instead of simply having a time slip, with the material used entered in, a properly marked slip could be used, which would be a complete history of the job. First of all, it would be necessary to take stock of the material on hand, accounting for everything, good or bad. What is no good can be weighed, and put on the scrap heap. The next step is to have properly marked and classified bins, or stands, with two divisions for each class of fitting, one for old and one for material already used once. You are now in a position to keep track of your stock, which is, in other words, your money.

When a new line of pipe is to be put up, instead of issuing orders to put it up, get an estimate on the job from your staff, whether in a large or small plant, just as you would from an outside firm. Let them (or him) go over the job, see the best way to run it, and measure up the quantity of pipe and the number of fittings required. The accuracy of the estimate will, of course, depend on the man, but at least there is something to go on.

When the job is done, a return should be made shewing exactly how much material has gone into the job, and how much scrapped. This material should be checked off from your inventory, if the plant is too small for a stock room and a card index system, and a copy kept in the office, and one given to the man in charge.

If a repair job, the slip should show:—
- Feet of pipe taken down.....
- Number and size of fittings taken down .....
- Feet of new pipe installed .....
- New fittings installed .....
- Pipe scrapped .....
- Fittings scrapped .....
- Pipe returned to shop for second use .....
- Fittings returned to shop for second use .....

This is checked up against your inventory, and the fittings scrapped added on to your scrap pile. This is surely not much trouble, and a monthly, two monthly, or six monthly checking up of your new, second-hand, and scrap material should pretty near account for every pound of material brought into the plant.

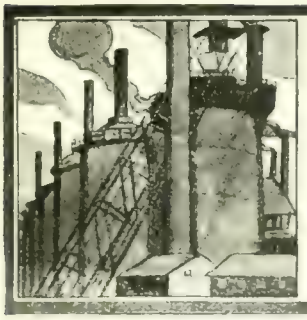
A system of this kind involves no extra bookkeeping and no extra clerical labor. It is just as easy for the department clerk to handle as the other one of merely charging up material used (or supposed to be used).

Whether the plant be large or small the amount saved in a year in this department would probably be a surprise to most managers, and in these days of high-priced material, every source of waste should be carefully guarded.

SEVERAL large firms in United States are out with circular letters urging that there should be a movement on the part of the several makers of certain lines looking to the fixing of prices for certain definite periods. The contention is that were prices named and fixed for six month periods business would be improved. That is a large, open question. Steel prices have been brought down about 15 per cent. from war levels, and the announcement is made officially that the figures will stand until the end of the year. In spite of all this, the Director-General of the Railway Board of U.S. says that he will have none of the fixed prices, and, moreover, he refuses to sanction placing tonnages of rails which are needed. Price-fixing is rather a delicate matter. The average buyer prefers the open market with restrictions removed.

MANY of the thinkers in trade circles are beginning to see that both United States and Canada have a big foreign market that has never been touched. Strange to say, this foreign market is right at home and consists of the foreign buying power on this continent. The idea is that they should appeal to them through the foreign press, teach them that it will pay them to stay rather than to leave for Europe and take their savings with them. It looks like a case where business and citizenship can be mixed to advantage.

The British Columbia Government has found a good way in which to spend money. Tax sales were advertised. The total amount of arrears was $904,041.29; the amount collected was $100,869.44, while the amount spent in advertising the sale was $42,061.03. For instance, in Barkerville the amount of arrears recovered was $4,239.18, while the Prince George *Citizen* is credited with $10,400.40 for advertising.



MARKET DEVELOPMENTS

Doubting Value of the Fixed Market Price

Indications Are That the Lowered Price is Not Going to Bring a Great Volume of Business Into the Market—More Price Reductions Noted in Lines That Did Not Cut on March 21

IF an immediate improvement were looked for in the steel and iron market following the announcement of a new schedule of fixed prices, there must be some disappointment over the way in which it is working out. Director-General Hines of the U.S. Railroad Board has forced the issue by declaring that he will not come into the market as contemplated with a $1,500,000 order for steel. Others, while not making such a dramatic spectacle, are serving the same purpose in other ways. Buyers do not like the "fixed" price idea. While admitting its need during the war period, they refuse to believe now that it can produce as good results for them as the old system of calling for tenders in an open and untrammelled market.

Boiler tubes have came down during the week. Lap-welded were cut last week and now seamless tubes are put down by about 8 per cent. Several such lines are trailing along in the price reduction procession, after having positively stated that they had no intention of noticing the cuts of March 21.

Machine tool dealers claim to be taking on a very satisfactory volume of business now. They also point with satisfaction to evidences of a renewal in the demand for new machinery, rather than for the used material, of which there is still a very large amount on the market. The new machinery persists in remaining on a very high price level, and departures from these figures have been rather infrequent and unimportant.

BIGGER BUSINESS IS LOOKED FOR IN THE MONTREAL MARKET

Special to CANADIAN MACHINERY

MONTREAL, Quebec, April 10.—Business and industrial activity is rapidly assuming its spring attitude and the trade here are anticipating developments within the next month that will open the way for a partial return to the activity of last summer.

The opening of navigation has always been the signal for expansion of Montreal and district business, so that all parties are justified in looking forward to busier times. Trading is becoming more normal, and although this process is general it is [illegible] condition more stable in character. The activity of the metal market is slowly improving, but demand is considerably below the normal. Steel conditions are showing up better and the coming of spring is a promising factor for larger business.

[illegible] but [illegible] in the disposal of Government owned [illegible] ment. Old material is again looking forward for a renewal of activity.

Better Steel Outlook.

No marked increase in steel demand has followed the decline in price, and the trade is apparently not yet prepared to start out on a buying movement, irrespective of the lower cost of material. There is undoubtedly some hidden influence affecting the entire situation, and until this atmosphere of uncertainty is removed from present industrial conditions no extensive expansion is likely to develop. It is evident that during the past week or two trading has been heavier, but the supposition is that the bulk of this was buying that was held over pending the reduction that has recently come into force. Few of the warehouses here were heavily loaded with the class of material that was most urgently needed, not because they did not care to carry a stock, but due to their inability to obtain delivery from the mills in the United States. This, while a serious handicap six months ago, has resulted to the advantage of dealers here, as they are now in a much better position to meet the lower scale that must inevitably become effective before domestic buying will develop to the point where futures are a feature. Dealers here have made another cut on plates, the current price being 5½c on 3-16 inch. Demand, however, has shown little material increase despite the lower figure, but early prospects are brighter. As stated by one dealer: "We are looking forward to increased activity within the next month. About the middle of April business invariably shows a freer tendency, and with the opening of navigation we are in some measure, compensate us for the slack period of the past several months."

Disposing of Government Tools

Recent developments in the machine tool situation across the line has aided in clearing away some of the mist that [illegible] time, but final plans of disposing of [illegible] the Government are yet in the making. If these agreements are approved by the different parties, the sale of all machines will be in the hands of the manufacturers and the dealers, the stipulation being that sales will be made alternately —one Government tool and one of the manufacturers. The commission that will be allowed for the sale of the tools now held by the Government will be 7½ per cent. It is not expected that these tools will be obtainable for a lower price [illegible] given for such reduction. There is a considerable quantity of machine tools in this district that will probably come under these new regulations, but dealers are not expecting to share very heavily in the disposal of this equipment. It is estimated that approximately $5,000,000 worth of machinery is tied up in this district alone. One plant that had received an order for small arms has over one hundred machines that have never been uncrated. A fair volume of business is reported, particularly in used machinery. Prices on ordinary second-hand tools are relatively low, but tool-room equipment retains its high figure.

Improvement Looked For

Although buying of old materials has not shown any great improvement here, the encouraging remarks of dealers apparently reflects a better tone, and the fact that quotations are quite firm would appear to indicate that a reaction might not be far distant.

The character of inquiries that are coming in from different consumers shows their interest in developments, and should conditions retain their cheerful atmosphere it would not be surprising to see some early buying. Dealers here are watching the market closely but are not yet anxious to renew their heavy buying. Prices are firmer than past week but no changes have been made.

REPORT DEMAND FOR MORE NEW MACHINERY

TORONTO—Business is better in machine tool lines than it has been for some time, certainly a long way ahead of what the firms were anticipating after the signing of the armistice. It is a good sign to see customers coming into the market for new machinery, instead of demanding to have their wants supplied from the used machinery market. Warehouses are doing a large amount of business, but they are not certain that the lower prices on plate and tubes has all to do with it. There is no indication that the new prices have made it desirable for the large buyers to come into the market on a generous scale yet.

Few More Reductions

It is just the least bit amusing to notice how, one after another, the various lines are falling in line and granting concessions to the trade which they said very plainly a few weeks ago they would not do for a long time yet. Makers of boiler tubes were quick on the job after the cuts of March 21 to announce they would not follow suit. Lapwelded tubes came down first, and now seamless is going to follow. There has not been any announcement on the latter yet, but some of the warehouses are announcing a new figure in advance of the mill statement. The American plants making seamless tubes took the matter up with the Canadian sellers, and asked them to use their own judgment in the matter, and recommend what was necessary. Later this was added to by telling them to go ahead and make concessions if such were necessary in order to secure business. The Canadian firms reported favoring a cut and also that it should be announced at once. The reduction which is given in detail on the market page, amount to about eight per cent.

The warehouse interests are well pleased with the amount of business they are securing, but this does not hold good with the firms that are selling for straight mill orders. An order that looks quite interesting to a warehousing concern holds little interest for the mill unless it happens to be one of many going in.

The National Railways and the C.P.R. are placing a lot of business for plate and boiler tubes.

There seems to be a little misunderstanding in regard to the way in which some of the prices are quoted in CANADIAN MACHINERY from time to time. For instance, one Ontario firm writes to ask if our quotation on iron bars is not too high. He has a quotation of $8.05 from a Canadian rolling mill, whereas the price we are quoting this week is $4.25. The prices quoted in our columns are warehouse prices, and they are always above the mill quotations. This same rule holds good in all lines. When plate was being quoted at 3c Pittsburgh, Chicago warehouses had a price of 4.27. With the new price of 2.65 on plate the Chicago warehouse will now be 3.90.

Selling New Machinery

Dealers in machine tools and supplies are well pleased with the business they are closing at present. Several of the firms are concentrating on the sale of new machinery and they are meeting with considerable success. One large Toronto firm has its machine tool salesman going to the United States this week to spend some time in the better machine shops there where quantity production is specialized in. We have been rather out of touch with this class of work in Canada, especially during the time of the war, as nothing much else was allowed but the production of munitions. Now that firms are turning to new lines, where they will have to meet competition, it is certain they will want the best methods known to the trade.

Motor plants are doing quite a good deal of buying now, and in several cases they are making an honest attempt to give a preference to lines they can secure in this country, but the equipment they need for their business calls for a lot that has to be imported.

Market is Firmer

Although scrap metal prices have not started to climb yet, it is easy to notice that there is a great deal more strength in the market than for some time past. There is a chance that fourth quarter copper may be hard to get. Just now dealers are not quoting or selling on that delivery, and if this should keep up for any length of time it would be certain to drive up the price in the local scrap markets. As it is those who have red brass now are asking more money for it.

In the other classes of metals much the same feeling is apparent. There have been no price changes and a certain amount of trading is going on at the lists published. But there is a growing and a well defined tendency on the part of the trade to hold material instead of making sales under present circumstances. Although dealers do not care to come out and say so it is one of those situations where it is felt that a great many things may happen on very short notice, and one of the happenings is likely to be a strengthening of prices which dealers will have to pay in order to induce holders to part with their material.

POINTS IN WEEK'S MARKETING NOTES

An effort is being made to wipe out the 25c difference between iron and steel bars in Toronto warehouses. Steel has always had a lead of 25c per hundred. As a matter of fact a good many iron orders have been filled with mild steel.

Those who have scrap material to dispose of are holding it more closely than ever. There are several indications that the market is going to be quite a bit stronger in the near future.

Director-General Hines of the U.S. Railroad Board refuses absolutely to recognize the new schedule of prices that have been set in the United States, and has not placed any business on the strength of their arrival. It was generally understood that with the announcement of lower prices the Government roads would come into the market for at least 1,500,000 tons of steel.

Machine tools dealers are quite well satisfied with the amount of business that is moving now. Several of the firms are concentrating all their efforts on the sale of new machinery against the demand for used stuff which has been rather insistent for some time past.

Montreal reports that trade prospects in that district are showing considerable improvement over recent months.

OWL METAL CO., LTD., ERECTING ADDITION TO FACTORY

Upon the death of E. H. Bissett, president of Bissett & Webb, Ltd., who controlled the stock in the Owl Metal Co., Ltd., Winnipeg, the estate sold his interest to E. G. and L. R. Barrett, of the Vulcan Iron Works, Winnipeg. More capital has thereby been influenced, and the firm intends to operate on a much larger scale than heretofore, and are now erecting an addition to their present factory.

They intend to recover metals from scrap and metal by-products, converting brass and bronze filings, turnings, borings, into ingots after refining.

Their white metal department for the manufacture of solders for tinsmiths and plumbers, and machine type metals for newspapers and printers, is also being largely extended. The plant which has been bought is the very latest for the refining and casting of metals. As a result of this re-organization, the whole of the stock in the Owl Metal Co. will

be held by well-known Western men. J. J. Broadhurst continues as secretary-treasurer and manager. The Owl Metal Co. have made arrangements to put out copper, red brass, yellow brass, and bronze in ingots suitable for machine shops. They are also manufacturing soldering salt, liquid and paste.

U.S. RAILROAD DIRECTOR WILL NOT RECOGNIZE THE NEW PRICES

Special to CANADIAN MACHINERY

PITTSBURGH, Pa., Apr. 10. —The whole talk of the trade in the past few days has been on the refusal of the Railroad Administration to proceed to make purchases on the basis of the iron and steel prices announced by the Industrial Board of the Department of Commerce, and made effective by producers March 21. A wide variety of opinions has been expressed on the subject of the refusal. As is frequently the case in human affairs the loudest talk is the most unthinking. Such commentators refer to Mr. Walker D. Hines, Director General of Railroads, as "blocking business," in substance, or as "throwing a monkey wrench into the machinery." Then there are references to the "fine Italian hand of John Skelton Williams," none of whose criticized actions in the past few months appeared to have been based upon anything but a desire to safeguard the public funds, which have to be maintained by taxes paid both by those who criticize and by those who do not. Mr. Hines has been criticized, also, for refusing to accept the steel prices after they were announced, instead of before, when it has not been shown that he had any previous opportunity to pass upon them.

Even though Congress has not acted as to the disposition of the railroads, it is a perfectly safe guess that they are going to be returned to their owners. It is only the additional legal restrictions, and the additional liberties, that are to be arranged that is a matter of doubt. Mr. Hines must return the goods to their owners in as good physical condition as when taken over, and improvements can be charged for, but only at a fair price. If Mr. Hines pays too much for steel the excess price must be paid out of the public funds. Mr. Hines needs only to consult the earnings reports of steel companies for 1918 to see that the profits per ton of steel were extremely large, and that profits would be entirely fair if prices were reduced, from the Government level, much more than they have been thus far. The owners of the railroads, with whom the steel producers have uniformly, up to this date, sympathized with so strongly, would have to be satisfied even with Mr. Hines meeting the extra cost of steel out of the public funds, for this would result in the railroads being saddled with an inflated market when the roads were returned to their owners. The railroad companies would then have to make their purchases on this inflated market, or perform the task of deflating it themselves.

Other Views

There are numerous other views expressed however. One, quite pertinent, is that the Industrial Board departed entirely from its original plan, as officially announced. The Board was to act as intermediary between producers and Government buying departments, to arrive at prices at which business would be done. Instead, what the Board did was to meet with the steel producers, agree upon their terms, and then try to force the Government departments to accept the terms.

Another criticism made of the Board, and made quite emphatically by many buyers of steel, is that the Board executed a complete right about face as to the character of prices to be developed, irrespective of whether they were high or low. It was announced that the law of supply and demand had ceased functioning, and that the object of the whole operation was to restore the operation of the law of supply and demand. This, of course, means an open trading market, but what the Board did by the time it got through was to publish a schedule of prices and then refer to them as being minimum for the remainder of the year. Not only does that not represent an open market, it covers a period three times as long as the periods for which the War Industries Board used to set prices.

The Pig Iron View

The pig iron producers are pleased rather than otherwise at the hitch in the carrying out of the Industrial Board's program. The pig iron people are more or less like the copper people. The copper producers allowed their market to go where it would, the result being that two or three weeks ago it reached a low point, at about 4 per cent. below the ten-year pre-war average price. Since then it has scored an advance of 5 per cent., and is standing on its own feet. The pig iron producers would not mind if pig iron declined below the cost of production would come down. The pig market would stiffen, and the cost of production woud come down. The pig iron producers, moreover, never did like the Industrial Board's schedule of prices, claiming that steel was reduced too little in proportion to pig iron. If steel had been reduced more, there would be more buying of steel, and then more consumption of pig iron. The pig iron producers recognize that profits depend upon price and production combined. If there is a profitable price, but no iron is made, there is no profit.

The Buyers of Steel

For many years the steel trade philosophy has been that the buyer has little title to say anything about prices or the market. It is for the sellers to do the talking. Fifteen years and more ago the buyer had practically nothing to say about the character of steel he wanted to buy. He was expected to take ordinary soft steel. If it was not strong enough, use more tons for a given purpose. In this matter there has been a radical revolution, nearly all steel producers being anxious to furnish the buyer with any description of steel he desires, and many steel producers even do research work at their own expense, to develop kinds of steel better suited to buyers' requirements. In the matter of price, however, the buyer is supposed to have as little to say as formerly.

The steel buyer has, however, expressed himself, and as a matter of fact he had expressed himself as to the Redfield Board prices, effective March 21, before the Railroad Administration refused to accept the prices. The buyer expressed himself by means of the character of his buying. The record made since March 21 is a very clear one. For a few days there was much heavier booking of orders, the orders showing that they represented business held back in anticipation of price reductions, whether when announced they should prove large or small. It was business that had to be placed in any event. Now, with the longer experience since March 21, all steel producers consulted admit that the bookings are of precisely the same character, and are from the same buyers, as earlier in the year. No new variety business, in other words, has been brought out by the price reductions. There is no steel for construction work or other general investment purposes. The buying is hand to mouth in character and is for common, every-day requirements. Averaging together the decreased rate of buying just before March 21, when business was being held back, and the greater rate of buying that obtained afterwards, the average rate is less than the buying rate in January and February.

Thus the ordinary buyer, the general public, buys no more than before the price reductions, and thus the public really went on record as to its appraisal of the new prices, before the Railroad Administration did.

At this writing the situation is entirely in confusion. Steel prices may be further reduced in the near future, or further time may be consumed in discussion. There is even a possibility that the steel producers will not hold together and that they will [illegible] market.

Steel mill operations are at about 75 per cent. of capacity, or a trifle less. Some of the mills have considerable business on books, some have very little and some have none, having already closed.

The four-wheel drive truck company of Clintonville, Wis., U.S.A., have decided to locate a Canadian branch of their concern in Kitchener. This will be an acquisition, as the concern will employ five hundred hands.

GENERAL MOTORS WILL BUILD $6,000,000 PLANT AT WALKERVILLE

Special to CANADIAN MACHINERY

New York, April 7, 1919.—In announcing new construction projects of the General Motors Corporation to be begun this year, President W. C. Durant stated that a $6,000,000 automobile plant for the Cadillac division will be built at Walkerville, Ont. A total of $37,398,000 has been appropriated for the concern's various plants as follows: Detroit, $12,650,000; Flint, $6,715,000; Pontiac, $2,150,000; Lansing, $2,450,000; Saginaw, $2,427,000; Toledo, $543,000; St. Louis, $4,135,000; Janesville, Wis., $4,500,000; Bristol, Conn., $1,078,000; Muncie, Ind., $800,000. A considerable part of the appropriations will doubtless be spent for machine-tool equipment for extensions to plants, the General Motors buying already this year having amounted to a very large sum.

Other automobile expansion is in prospect. Henry Ford is reported to have purchased a 30-acre site at South Boston, Mass., for an automobile plant, but this has not yet been officially confirmed. The Studebaker automobile plant at South Bend, Ind., will be considerably expanded.

Lower Prices Coming?

Buying of machine tools in the American centres continues in fair volume, though the expectation among buyers that prices will soon be lower is injecting a spirit of hesitancy that sellers do not like to see. There are a great many inquiries, but orders are difficult to close. A difference of opinion exists among machine-tool manufacturers on the question of price reductions. Some say that prices which were unduly raised during the war period should be brought down to a proper level, but it is claimed that in a majority of instances advances in prices were only sufficient to cover increased costs of labor and material. While material costs have been lowered somewhat since the end of the war, labor costs are not coming down, and probably will not for some time. It is stated that there is an exaggerated idea among buyers as to the extent to which the reduced prices of pig iron and steel affect the cost of a machine tool, which is about 80 per cent. labor.

However much explaining the machine-tool trade may do, the idea seems firmly rooted in the minds of buyers that prices will come down, and much business is unquestionably being held back on that account. Other factors which are disturbing the machine-tool trade as well as the general business situation are: (1) Uncertainty and nervousness as to the treaty of peace; (2) the snarl at Washington over the question of agreed prices for iron and steel; (3) the slowness of the Government in settling claims on war contracts; (4) the delay in new construction projects, due to high prices and difficulty in obtaining bank loans, and (5) the approaching Victory loan. In addition, foreign trade is somewhat disturbed because of the unsettled conditions in Europe, the unfavorable rates of foreign exchange and high ocean freight rates.

The French High Commission, which has placed orders on a list of about $1,000,000 worth of machine tools to be used in reconstruction work in France, has temporarily suspended all buying, and has held up some of the orders which had not been confirmed. Probably nothing will be done until the peace treaty is signed.

The machine-tool trade, while somewhat discouraged by existing conditions, believes that the present large volume of inquiries is indicative of a potential large business, which sooner or later will develop. There are numerous export prospects in the market. A representative of a Belgian automobile, motorcycle and bicycle plant, which was destroyed in the war, is in New York to purchase a complete new plant equipment. A Philadelphia engineering concern is inquiring for several hundred tools for export to Belgium.

The Standard Oil Co., of New Jersey, has sent out additional inquiries during the past week for the equipping of a ship repair plant at Bayway, N.J. It is also inquiring for tools for machine shops at new oil refineries to be built in South Carolina and Texas. It is reported that the company may soon inquire for a large list of equipment for a new shipyard in Norway.

Crane manufacturers are finding quite a bit of business to bid on, but few orders are being placed. Locomotive crane builders have approximately three months' work ahead in completing old orders placed during the war. Since the ending of the war the new orders placed for locomotive cranes have amounted to less than 10 per cent. of the capacity of all the plants in the United States.

PROTESTS AGAINST THE POLICY OF IMPERIAL MUNITIONS BOARD

GALT "Reporter":—The Imperial Munitions Board is dumping into the market a large amount of material, which it is disposing of at bargain-day rates, to the injury of manufacturers who are putting forth prodigious efforts, not only to keep their war staffs fully employed, but also to make room for returned soldiers seeking jobs.

The Board's policy does not ring true to the appeal of the Government for a continuance of energy in productive work. Individuals, corporations and communities have set their jaws to carry out their pledges to veterans. Under their eyes movements are progressing for the amelioration of the distressed; for the steadying of business affairs; for the materialization of a variety of plans conceived in the interest of the masses. How is it possible to obtain the best results—looked-for results on the part of the Government departments seized with the importance of a rapid readjustment of trade conditions based on normal distribution of our products—with a great Public Service disrupting business by unloading material on a more or less gorged market, to which legitimate interests have been looking for support in these trying reconstruction days? How can business be steadied by introducing an element of disorganization at a most critical period? Is it putting the matter too strong to say that this dumping by the Imperial Munitions Board shows that some persons in authority are displaying little concern either for the men at work or the unemployed.

And "dumping" it truly is.

Much of this machinery—engines, boilers, iron tools, lathes, etc.—came in duty free from the United States under an agreement with the Board. Now what is happening? To put it briefly, this: Instead of paying a duty of 42½ per cent. on the selling price at the United States shop, by an arrangement with the Department of Customs the duty is assessed against the selling price under the forcing process of the Imperial Munitions Board, which has been instructed to rid itself of the left-over material at the earliest possible moment. We are not told that the Board protested against a forced disposal at this time, giving good reasons for its patriotic attitude. If it saw the injustice of the arrangement that is what Sir Joseph Flavelle and his colleagues should have done. We are left in ignorance as to this. We are compelled to believe that the Board faithfully, and without consideration for home interests, submitted to the instructions from England and proceeded with all haste to carry out the same.

To-day machinery for which $100,000—or more—was paid is being sold to large concerns for less than one-half the invoice price, plus the duty, not on import figures, but on the bargain quotation from the Imperial Munitions Board. In other words, the duty collected amounts to about 10 per cent., and thus are the manufacturers of Galt forced to meet nothing less than cut-throat competition having the connivance of men in authority at Ottawa. Recently possible sources of business were closed to several Galt industries because of the Imperial Munitions Board's activity in dumping enterprises. The Board's customers, representing millions of capital and millions of profits, are well able to buy in a normal market, and without the alluring terms coming from Sir Joseph

Continued on page 369

SELECTED MARKET QUOTATIONS

Being a record of prices current on raw and finished material entering into the manufacture of mechanical and general engineering products.

PIG IRON

Grey forge, Pittsburgh	$27 15
Lake Superior, charcoal, Chicago	34 60
Standard low phos., Philadelphia	
Bessemer, Pittsburgh	29 35
Basic, Valley furnace	25 75
Toronto price:—	
Silicon..2.25% to 2.75%	$32.75 to $35.75

IRON AND STEEL

Per lb. to Large Buyers	Cents
Iron bars, base, Toronto	$ 4 25
Steel bars, base, Toronto	4 25
Steel bars, 2 in. to 4 in. base	5 50
Steel bars, 4 in. and larger base	6 00
Iron bars, base, Montreal	.75
Steel bars, base, Montreal	3 75
Reinforcing bars, base	4 50
Steel hoops	5 50
Norway iron	11 00
Tire steel	5 50
Spring steel	8 00
Brand steel, No. 10 gauge, base	4 40
Chequered floor plate, 3-16 in.	9 25
Chequered floor plate, ¼ in.	9 00
Staybolt iron	8 00
Bessemer rails, heavy, at mill	
Steel bars, Pittsburgh	2 35
Tank plates, Pittsburgh	2 65
Structural shapes, Pittsburgh	2 45
Steel hoops, Pittsburgh	3 30
F.O.B., Toronto Warehouse	
Small shapes	4 50
F.O.B. Chicago Warehouse	
Steel bars	.62
Structural shapes	3 72
Plates	3 90
Small shapes under 3"	3 62

FREIGHT RATES

	Per 100 lbs C.L.	L.C.L.
Pittsburgh to Following Points		
Montreal	29	39½
St. John, N.B.	47½	63
Halifax	49	64½
Toronto	23½	27½
Gueplh	23½	27½
London	23½	27½
Windsor	23½	27½
Winnipeg	81	106½

METALS

Lake copper	$19 00	$20 00
Electro copper	18 50	19 00
Castings, copper	17 25	19 00
Tin	60 00	58 00
Spelter	9 00	8 50
Lead	6 75	7 50
Antimony	8 00	8 50
Aluminum	35 00	40 00

Prices per 100 lbs.

PLATES

	Montreal	Toronto
Plates, ½ up	$ 5 00	$ 4 50
Plates, 3-16 in.	5 50	4 90

Price List No. 38

Standard Buttweld

	Per 100 feet	
⅛ in.	$ 6 00	$ 8 00
¼ in.	4 68	6 81
⅜ in.	4 68	6 81
½ in.	6 21	7 78
¾ in.	7 82	9 95
1 in.	11 56	14 71
1¼ in.	15 64	19 90
1½ in.	18 70	23 76
2 in.	25 16	32 01
2½ in.	40 37	51 19
3 in.	52 79	66 94
3½ in.	67 16	84 18
4 in.	79 57	99 74

Standard Lapweld

2 in.	38 81	35 34
2½ in.	42 12	52 36
3 in.	55 08	68 47
3½ in.	69 00	86 94
4 in.	81 75	103 00
4½ in.	93	1 18
5 in.	1 08	1 37
6 in.	1 40	1 78
7 in.	1 83	2 32
8L in.	1 93	2 44
8 in.	2 22	2 81
9 in.	2 66	3 36
10L in.	2 46	3 12
10 in.	3 17	4 02

Terms 2% 30 days, approved credit.

Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Prices—Ontario, Quebec and Maritime Provinces.

WROUGHT NIPPLES

4" and under, 45%.
4½" and larger, 40%.
4" and under, running thread, 25%.
Standard couplings, 4" and under, 35%.
4½" and larger, 15%.

OLD MATERIAL

Dealers' Buying Prices.

	Per 100 Pounds Montreal	Toronto
Copper, light	$10 50	$10 00
Copper, crucible	13 00	12 75
Copper, heavy	13 00	12 75
Copper wire	13 00	12 75
No. 1 machine composition	10 00	12 00
New brass cuttings	8 00	9 00
Red brass turnings	8 00	8 50
Yellow brass turnings	6 00	6 00
Light brass	5 00	5 00
Medium brass	8 00	6 00
Scrap zinc	4 00	5 00
Heavy lead	3-4	4 00
Tea lead	2-3	3 00
Aluminum	15 00	12 00
	Per Ton	
Heavy melting steel	10 00	9 00
Shell turnings	6 00	6 00
Boiler plate	10 00	8 00
Axles (wrought iron)	20 00	15 00
Rails	15 00	11 00
Malleable scrap	15 00	12 00
No. 1 machine cast iron	18 00	14 00
Pipe wrought	9 00	5 00
Car wheels	20-22	18 00
Steel axles	22 00	20 00
Mach. shop turnings	5 00	5 00
Stove plate	14 00	10 00
Cast boring	8 00	8 00

BOLTS, NUTS AND SCREWS

	Per Cent
Carriage bolts, ⅜" and less	35
Carriage bolts, 7-16 and up	15
Coach and lag screws	50
Stove bolts	65
Wrought washers	45
Elevator bolts	25
Machine bolts, 7-16 and over	25
Machine bolts, ⅜ and less	40
Blank bolts	25
Bolt ends	25
Machine screws, fl. and rd. hd., steel	27½
Machine screws, o. and fil. hd., steel	10
Machine screws, fl. and rd. hd., brass	net
Machine screws, o. and fil. hd brass	net
Nuts, square blank	add $0 75
Nuts, square, tapped	add 1 00
Nuts, hex., blank	add 1 00
Nuts, hex., tapped	add 1 25
Copper rivets and burrs, list plus	15
Burrs only, list plus	40
Iron rivets and burrs	40 and 5
Boiler rivets, base ¾" and larger	**$8 50**
Structural rivets, as above	**8 40**
Wood screws, flat, bright	75
Wood screws, O. & R., bright	70
Wood screws, flat, brass	40
Wood screws, O. & R., brass	5
Wood screws, flat, bronze	30
Wood screws, O. & R., bronze	27½

MILLED PRODUCTS

	Per Cent
Set screws	25
Sq. and Hex. Head Cap Screws	20
Rd. and Fil. Head Cap Screws	net
Flat But. Hd. Cap Screws	plue net
Fin. and Semi-fin. nuts up to 1 in.	25
Fin. and Semi-fin. nuts, over 1 in., up to 1½ in.	20
Fin. and Semi-fin. nuts over 1½ in., up to 2 in.	plus 10
Studs	net
Taper pins	40
Coupling bolts, plus	10
Planer head bolts, without fillet, list plus	10
Planer head bolts, with fillet, list plus 10 and	10
Planer head bolt nuts, same as finished nuts.	
Planer bolt washers	net
Hollow set screws	list plus 20
Collar screws	list plus 30. 10
Thumb screws	20
Thumb nuts	65
Patch bolts	add 40. 10
Cold pressed nuts to 1½ in.	add $4 50
Cold pressed nuts over 1½ in.	add 7 00

BILLETS

	Per Ton
Bessemer billets	$38 50
Open-hearth billets	38 50
O.H. sheet bars	42 00
Forging billets	51 00
Wire rods	52 00

Government prices.
F.O.B. Pittsburgh.

NAILS AND SPIKES

Wire nails	$4 70
Cut nails	4 75
Miscellaneous wire nails	60%
Spikes, ⅜ in. and larger	$7 50
Spikes, ¼ and 5-16 in.	8 00

ROPE AND PACKINGS

Drilling cables, Manila	0 39
Plumbers' oakum, per lb.	0 10
Packing, square braided	0 38
Packing, No. 1 Italian	0 44
Packing, No. 2 Italian	0 36
Pure Manila rope	0 37
British Manila rope	0 31
New Zealand hemp	0 31
Transmission rope, Manila	0 43
Cotton rope, ¼-lb. and up	0 74

POLISHED DRILL ROD

Discount off list, Montreal and Toronto	net

MISCELLANEOUS

Solder, strictly	0 34
Solder, guaranteed	0 39
Babbitt metals	18 to 70
Soldering coppers, lb.	0 58
Lead wool, per lb.	0 14
Putty, 100-lb. drums	6 75
White lead, pure, cwt.	17 80
Red dry lead, 100-lb. kegs, per cwt.	15 50
Glue, English	0 35
Tarred slater's paper, roll	1 30
Gasoline, per gal., bulk	0 33
Benzine, per gal., bulk	0 32
Pure turpentine, single bbls.,gal.	1 10
Linseed oil, raw, single bbls.	1 70
Linseed oil, boiled, single bbls.	1 73
Plaster of Paris, per bbl.	4 50
Sandpaper, B. & A.	List plus 43
Emery cloth	list plus 37½
Sal Soda	0 03½
Sulphur, rolls	0 05
Sulphur, commercial	0 04½
Rosin "D," per lb.	0 07
Rosin "G," per lb.	0 08
Borax crystal and granular	0 14
Wood alcohol, per gallon	2 00
Whiting, plain, per 100 lbs.	2 50

CARBON DRILLS AND REAMERS

	Per Cent.
S.S. drills, wire sizes up to 52	35
S.S. drills, wire sizes, No. 53 to 80	40
Standard drills to 1½ in.	40
Standard drills, over 1½ in.	40
3-fluted drills, plus	10
Jobbers' and letter sizes	40
Bit stock	40
Ratchet drills	15
S.S. drills for wood	40
Wood boring brace drills	25
Electricians' bits	30
Sockets	40
Sleeves	40
Taper pin reamers	net
Drills and countersinks	list plus 40
Bridge reamers	50
Centre reamers	10
Chucking reamers	net
Hand reamers	10
High speed drills, list plus	75
High speed cutters, list plus	40

COLD ROLLED SHAFTING

At mill	list plus 40%
At warehouse	list plus 60%

Discounts off new list. Warehouse price at Montreal and Toronto

IRON PIPE FITTINGS

Malleable fittings, class A, 20% on list; class B and C, net list. Cast iron fittings, 15% off list. Malleable bushings, 25 and 7½%; cast bushings, 25%; unions, 45%; plugs, 20% off list. Net prices malleable fittings; class B black, 24½c lb.; class C black, 15¾c lb.; galvanized, class B, 34c lb.; class C, 24½c lb. F.O.B. Toronto.

SHEETS

	Montreal	Toronto
Sheets, black, No. 28	$ 6 55	$ 6 25
Sheets, black, No. 10	5 15	5 25
Canada plates, dull, 52 sheets	8 50	8 00
Can. plates, all bright	8 50	9 00
Apollo brand, 10¾ oz. galvanized	.....	.....
Queen's Head,28 B.W.G.	.....	.....
Fleur-de-Lis, 28 B.W.G.	.....	.....
Gorbal's Best, No. 28	.....	.....
Colborne Crown, No. 28	.....	.....
Premier, No. 28 U.S.	.....	7 85
Premier, 10¾ oz.	.....	8 50
Zinc sheets	20 00	20 00

PROOF COIL CHAIN

B

¼ in., $14.35; 5-16 in., $13.85; ⅜ in., $13.50; 7-16 in., $12.90; ½ in., $13.20; $13.00; ⅝ in., $12.90; 1 inch, $12.65; Extra for B.B. Chain, $1.20; Extra for B.B.B. Chain, $1.80.

ELECTRIC WELD COIL CHAIN B.B.

⅛ in., $13.00; 3-16 in., $12.50; ¼ in., $11.75; 5-16 in., $11.40; ⅜ in., $11.00; 7-16 in., $10.60; ½ in., $10.40; ⅝ in., $10.00; ¾ in., $9.90.

Prices per 100 lbs.

FILES AND RASPS.

	Per cent.
Globe	50
Vulcan	50
P.H. and Imperial	50
Nicholson	32½
[illegible]	27½
J. Barton Smith, Eagle	50
McClelland, Globe	50
Delta Files	20
Disston	40
Whitman & Barnes	50
Great Western-American	50
Kearney & Foot, Arcade	50

BOILER TUBES.

Size	Seamless	Lapwelded
1 in.	$25 00	$.....
1¼ in.	29 99	.....
1½ in.	32 00	28 00
1¾ in.	32 00	28 00
2 in.	36 00	28 00
2¼ in.	40 00	30 00
2½ in.	41 00	35 00
3 in.	47 00	40 00
3¼ in.	.....	47 00
3½ in.	57 00	48 00
	65 00	60 00

Prices per 100 ft., Montreal and Toronto les 10.

OILS AND COMPOUNDS.

Castor oil, per lb.	
Royalite, per gal., bulk	19½
Palacine	22½
Machine oil, per gal.	27½
Black oil, per gal.	16
Cylinder oil, Capital	52
Cylinder oil, Acme	39½
Standard cutting compound, per lb.	0 06
Lard oil, per gal.	$2 60
Union thread cutting oil antiseptic	88
Acme cutting oil, antiseptic	37½
Imperial quenching oil	39½
Petroleum fuel oil, bbls. net	10¼

BELTING—NO. 1 OAK TANNED.

Extra heavy, single and double	30%
Standard	30,10%
Cut leather lacing, No. 1	2 20
Leather in sides	1 75

TAPES.

Chesterman Metallic, 50 ft.	$2 00
Lufkin Metallic, 603, 50 ft.	2 00
Admiral Steel Tape, 50 ft.	2 75
Admiral Steel Tape, 100 ft.	4 45
Major Jun. Steel Tape, 50 ft.	3 50
Rival Steel Tape, 50 ft.	2 75
Rival Steel Tape, 100 ft.	4 45
Reliable Jun. Steel Tape, 50 ft.	3 50

PLATING SUPPLIES.

Polishing wheels, felt	3 25
Polishing wheels, bull-neck	2 00
Emery in kegs, American	07
Pumice, ground	3½ to 05
Emery glue	28 to 30
Tripoli composition	06 to 09
Crocus composition	08 to 10
Emery composition	08 to 09
Rouge, silver	35 to 50
Rouge, powder	30 to 45

Prices Per Lb.

ARTIFICIAL CORUNDUM

Grits, 6 to 70 inclusive	.08½
Grits, 80 and finer	.06

BRASS

Brass rods, base ½ in. to 1 in. rod	0 38
Brass sheets, 24 gauge and heavier, base	0 43
Brass tubing, seamless	0 46
Copper tubing, seamless	0 48

WASTE

White	Cts. per lb.		
XXX Extra	19½	Atlas	17
Peerless	19	X Empire	15½
Grand	18	Idea!	16
Superior	18	X press	14
X L C R	17		

Colored.

Lion	15	Popular	12
Standard	13½	Keen	10½
No. 1	13½		

Wool Packing.

Arrow	25	Anvil	15
Axle	20	Anchor	11

Washed Wipers.

Select White	11	Dark colored	09
Mixed colored	10		

This list subject to trade discount for quantity.

RUBBER BELTING.

Standard	10%	Best grades	15%

ANODES.

Nickel	.58 to .65
Copper	.38 to .45
Tin	.70 to .70
Zinc	.18 to .18

Prices Per Lb.

COPPER PRODUCTS.

	Montreal	Toronto
Bars, ½ to 2 in.	$42 50	$43 00
Copper wire, list plus 10		
Plain sheets, 14 oz., 14x60 in.	46 00	44 00
Copper sheet, tinned, 14x60, 14 oz.	48 00	48 00
Copper sheet, planished, 16 oz. base	46 00	45 00
Braziers', in sheets, 6 x 4 base	45 00	44 00

LEAD SHEETS.

	Montreal	Toronto
Sheets, 3 lbs. sq. ft.	$10 25	$11 50
Sheets, 3½ lbs. sq. ft.	10 00	11 00
Sheets, 4 to 6 lbs. sq. ft.	9 75	10 50

Cut sheets, ½c per lb. extra.
Cut sheets to size, 1c per lb. extra.

PLATING CHEMICALS.

Acid, boracic	$ .25
Acid, hydrochloric	.06
Acid, nitric	.14
Acid, sulphuric	.06
Ammonia, aqua	.23
Ammonium carbonate	...
Ammonium, chloride	.55
Ammonium hydrosulphuret	.30
Ammonium sulphate	.15
Arsenic, white	.27
Copper, carbonate, annhy	.50
Copper, sulphate	.22
Cobalt, sulphate	.20
Iron perchloride	.40
Lead acetate	.35
Nickel ammonium sulphate	.25
Nickel carbonate	.32
Nickel sulphate	.35
Potassium carbonate	1.80
Potassium sulphide (substitute)	2 25
Silver chloride (per oz.)	1.45
Silver nitrate (per oz.)	1.20
Sodium bisulphite	.15
Sodium carbonate crystals	.05
Sodium cyanide, 127-130%	.40
Sodium hydrate	.22
Sodium hyposulphite, per 100 lbs.	6.00
Sodium phosphate	.18
Tin chloride	1.75
Zinc chloride, C.P.	.80
Zinc sulphate	.15

Prices per lb. unless otherwise stated.

Flavelle and his colleagues would certainly do so, thus helping along the movement to sustain employment in the interest of the country at large. We may well imagine what Sir Joseph Flavelle would have said in answer to a proposal to dump ten or twenty thousand tons of American pork products, bought by the British Government for consumption by the troops in France, on the Canadian market at figures below market prices and freed from the normal duty. But that's another story—or perhaps the suggestion is a cruel reminder of recent events that stirred the country. As it is, the machine shops of Galt have been hit by a policy that does not dovetail into the protestations of administrative leaders concerned as to the unemployment problem.

HIGHER PRICES SEEM CERTAIN TO COME IN U.S. SCRAP MARKET

THERE are signs of a revival in the scrap iron and steel market, and while this is not general, in some places it has been very marked. In some cases the activity is due to the dealers laying in stocks to hold for the rise in prices that they feel is bound to come. Following are reports from United States points:—

Philadelphia.—A price of $15.75 delivered has been offered for a large tonnage of steel by a large eastern interest. The whole scrap market is showing renewed strength, and this is specially notable in heavy melting steel. $16.50 delivered and $17 for May delivery is being quoted, while wrought iron pipe is up to $17.50 to $18.50 on buying by the Bethlehem Steel Co.

New York.—Prices are holding firm, with little change in the local market. Most of the demand is confined to heavy melting steel, though there is a fair demand for wrought pipe. The increased business expected from the cut in iron and steel prices has not yet developed, but there is a cheerful note to the market, keeping prices firm on all grades.

Pittsburgh.—While for some time past the seeking has been all on the side of the dealers, consumers are now on the lookout for supplies. This condition has resulted in a stiffening of prices. Enquiries are pretty numerous, and while there is not much actual business, prices of all cast scrap are on the upward move. Heavy melting steel is quoted at $16.

Buffalo.—What is believed by dealers to be the beginning of a heavy buying movement, is the statement that the Steel Co. has entered the market for a large quantity of heavy melting steel. This class of material is now quoted at $14.50 to $15, an increase of 50 cents. Turnings and borings are in good demand.

Cleveland.—There is very little doing in the scrap market in this district. A number of consumers are either shut down or are running slack. It is expected that from one to two months will elapse before anything considerable is done. Turnings are quoted at $8 to $8.50, and No. 1 bushelling has advanced 50 cents from $14.50 to $15.

Chicago.—The activity in the market here is furnished by dealers who are laying down considerable quantities of material in their yards to hold for what they consider the inevitable rise of prices. Although there is not much buying by consumers, the general situation is better than formerly. The Chicago, Milwaukee and St. Paul offers 1,200 tons, the Chicago and North Western 2,500 tons, and the Wabash 400 tons cast iron car and locomotive wheels.

Cincinnati—With a very small demand evidenced, there has been almost no change in the scrap market in this district during the week. Prices are the same as those quoted last week. There are a few enquiries which seem to be more on the line of keeping in touch with price movements than a genuine desire to buy.

St. Louis.—Prices have gone up a little in this district, due to small offerings, and some competition among dealers. This is not a consumers' market, small purchases by steel mills being the only buying of this class. The railroads are offering some scrap, the St. Louis Terminal Railway having sold 300 tons of rails this week at good prices.

Birmingham.—What trading is being done here is by dealers buying in for future trading. Quotations are low. There is much more stock in yards than was the case three or four months ago.

LOWER IRON PRICES HAS NOT BROUGHT MUCH NEW BUSINESS

THE reduction in pig iron prices has not brought the revival that was expected in some quarters. While enquiries are more numerous in some districts, in others there is little change from the prevailing dullness of the past few weeks. Following are reports from different districts through the country:

Philadelphia.—There has been an improved enquiry in this district, resulting in much better feeling in the market. There have been sales amounting to more than 2,000 tons, in which was included a lot of 500 tons of low phosphorus for the Chicago district.

New York.—The large amount of business that was expected to eventualize on the reduced prices, has so far failed to make an appearance. It was thought that the reduced prices would wipe out the uncertainty in the market, but so far this has not proved to be so. There are rumors that iron can be obtained at less than the minimum rates, but there is nothing to corroborate these rumors. Export orders are scarce, but a good number of shipments on old orders are being handled, as space in vessel becomes available.

Pittsburgh.—The market here is not by any means active, the tendency of consumers being to use up the stock they have on hand and on contract before going into the market for more. Business has not been helped much by the recent cut in prices, and the belief is held that the cut was too drastic, considering that the price of the raw materials was left untouched.

Buffalo.—What selling there has been here has been in carload lots at the new prices, and enquiries have also been confined to small lots. Reduction in prices has not resulted in revival of business, and many producers feel that there will have to be a readjusting period before any stimulation is apparent.

Cleveland.—There has been some increase in both sales and enquiry this week, for second quarter and last half. One sale of 2,000 tons foundry iron is reported, as well as smaller lots. One local automobile casting concern has been taking 2,000 tons a month [illegible] piling of iron in furnace yards is still going on, but shipments in general have been better.

Chicago.—Pickands, Brown & Co., the leading producers here, were the first to apply the reduced prices to all iron shipped after March 21st [illegible] have followed their lead. The step was taken independently of the price stabilizing plan emanating from Washington. The idea was that contract holders were entitled to the benefits of the reduced prices as well as those who are only now buying.

Cincinnati.—Few enquiries and small sales are the features of the market here. The reduced prices have not had any stimulating effect.

St. Louis.—Enquiries in this district have shown a great increase since the announcement of the price reductions although [illegible] been closed.

Birmingham.—Furnaces are still being blown out in this district. The Ironton furnace of the Alabama Co. has been blown out, among others. It is likely that other furnaces will be banked during the week, if further orders are not forthcoming.

Toronto. [illegible] the Toronto Harbor Board, Mayor Church announced that Toronto's claim for a just share of shipbuilding contracts had not yet been relinquished. Representatives of the city will approach the Dominion Government after the Easter recess to request more generous treatment in this respect, and also to present a petition for the erection of a grain elevator in Toronto.

ATLANTIC CROSSED BY STEAMER FOR FIRST TIME JUST 81 YEARS AGO NOW

London.—At this time when eager preparations are being made for crossing the Atlantic by aircraft, it is interesting to recall that eighty-one years ago "The Times" recorded the departure from the Thames of the first vessel to cross to America under steam. From the issue of March 31, 1939, is reproduced the following paragraphs:

The experiment of a steam voyage from England to America has commenced. On Wednesday afternoon, March 28, the St. George Steam Packet Company's powerful steamship Sirius, Lieutenant Roberts, R.H., Commander, sailed from the East Lane Stairs for New York, proceeding in the first instance to Cork, from where she will start to her destination on Monday next. The Sirius is a vessel of 700 tons with an engine of 320 horse-power, and has been fitted up in most splendid manner. It is expected she will complete the voyage in fifteen days, and so confident are her owners that they have already announced her setting out from New York on the return voyage on the first of May. She carries from London twenty-two passengers, but this number will be considerably augmented at Cork. She does not take out goods, being intended as a passenger ship only.

Quebec Second to Sail

Soon after the departure of the Sirius the American Line packet ship Quebec, Captain Herbert, for New York, came down the river in tow of a steam packet. She carried out 171 emigrants; cabin 17; between decks, 32; and steerage, 122. The latter were chiefly agricultural laborers and their families. Some parties were bold enough to lay a wager that the Quebec would arrive before the Sirius at New York.

The Sirius, however, reached New York April 22, and duly left again for England May 1.

An express message from Falmouth, published in "The Times" May 21, recorded her arrival at that port after a voyage home of eighteen days.

Made Initial Voyage

A five-year-old boy passenger on the outward voyage of the Sirius is still living at Dorset. He is the Rev. V. F. Ransome, a retired country rector, and Rev. F. L. Blathwayt of Melbury, Osmund Rectory, in Dorset, who has just had a conversation with him, informs us in a letter that Mr. Ransome clearly remembers his experiences. Our correspondent says the Sirius was a two-masted, one-funneled steamer, 178 feet in length; she carried 450 tons of coal on the voyage, being loaded almost to the water's edge, but ran so short of fuel she had to burn every spare yard spar, and even rosin, of which she carried fifty-eight casks.

"A printed abstract of her log, which lies before me as I write," Mr. Blathwayt says, "shows she encountered at times heavy seas, gales, sleet and snow, and when the vessel left Cork there were only six first-class passengers left on board, the others being so alarmed by the run down the English Channel that they disembarked and forfeited their passage money."

COMPETING FOR CANADIAN TRADE

What British Firms Think About Canadian Market at Present

LONDON, March 30.—Discussing the question of the Canadian market with a representative of CANADIAN MACHINERY the secretary of the British Machine Tool and Engineering Association remarked that at the present time the prospect in front of exporters was not a very bright one. During the war the whole of the output of the English machine tool industry had gone to swell the making of munitions. Since the armistice the Government subsidy on steel has been withdrawn, and steel had gone up in price. This had made it increasingly difficult to resume competition in the Canadian market with makers in the States who were now on a much easier footing than ever before.

BRITISH SLOW TO FOLLOW OPENINGS?

Could Shops on Pacific Coast Compete For Asiatic Business?

LONDON (Special).—The secretary of a large engineering organization in London remarked that at present one of the chief obstacles to the increase of the British machinery market in Canada was the absence of imagination amongst the manufacturers themselves, and the lack of combination between the various branches whose trade interests were identical. At the moment the attention of firms was largely absorbed by the enormous demands for machinery coming from destroyed industrial areas in Northern France and Belgium, and whilst satisfying these and assisting in European reconstruction there was a danger of overlooking the possibilities offered in Canadian markets which might never occur again. It was, also, not fully realized that American competition in the far East and in Canada might be successfully met by establishing factories in Western Canada and using Victoria as a jumping off ground.

IS CANADA NOT WELL ENOUGH KNOWN?

Greece Was Not Going to Consider This Country in Matter of Contracts

On March 7 the Canadian Trade Commission issued the following statement: "The Greek Government is in the market for 500,000 steel railway ties of 242 pounds weight each. Canadian firms contemplating bidding must take immediate action, as the demand is urgent. American firms are known to be already in the field. The Canadian Trade Commission believes that this may give Dominion manufacturers a chance to use surplus steel and the forging presses which were installed for munition making."

A representative of the Trade Commission afterward interviewed Mr. E. Travelos, chairman of the Hellenic Commission in the United States, with regard to the inquiry for half a million steel ties for the Greek Government. Mr. Travelos stated his instructions were for 100,000 at 155 pounds weight, and was not aware that Canadian steel manufacturers were prepared to bid on this order, but when informed, said he would be glad to give every opportunity to Canadian firms to compete. He preferred to handle inquiries through the Canadian Trade Commission in Ottawa, and agreed to send specifications, blue prints and other details as soon as ready.

On the general question of Canadian trade with Greece, the chairman of the Hellenic Commission said very frankly that Canada as a source of supply had not been considered by his Commission. He requested full information on the Dominion's capacity. An invitation to Mr. Travelos to visit Canada, and especially Ottawa, has been extended. Mr. Travelos thought that if the matter of credits could be arranged, an enormous quantity of work which had to be undertaken in Greece could be arranged. He especially mentioned a scheme for the water supply of Athens.

INCORPORATIONS

Incorporation has been granted to the Stamped Metal Products Co. of Canada, Ltd., to carry on business of mining, smelting, casting, forging, rolling, etc. The capital stock is $6,000,000, issued in $100 shares, and the chief place of business is at Toronto.

Incorporation has been granted to "The A. R. Williams Machinery & Supply Co., Ltd.," with chief place of business at Montreal, for the purpose of manufacturing, dealing in, repairing, etc., engines, boilers, power plant, electrical, hydraulic equipment, etc. The capital is placed at $500,000 and the head office is at Montreal. Incorporation is granted as a private concern.

Notice appears in the "Canadian Gazette" that letters have been issued incorporating J. A. Campbell, manufacturer, S. S. Anderson, F. C. Kerby, all of Windsor; J. B. Gunn, of Winnipeg, and others, for the purpose of manufacturing, trading in conveyances and vehicles, motors, machinery, engines, boilers, etc., under the name of "Canadian Collapsible Rim Co., Ltd." The capital stock is $500,000 and the chief place of business is to be at Windsor, Ont.

DOMINION STEEL HAS WON ACTION

English Courts Have Given Decision Against Owners of the Vessels

Montreal.—Cable advice received from London stated that the case brought by the Dominion Steel Corporation in the English courts to force the owners of a number of ships, under charter when war broke out in 1914 to the Canadian concern, to carry out their contracts has been decided in the corporation's favor.

The court has ruled that the owners must return the vessels to the company until the expiration of the charters, which are for long terms, just as soon as they are released from Government service. The return of the steamers will permit of the pre-war trade in coal from Nova Scotia mines to St. Lawrence River ports being resumed at a comparatively early date. Although the definite text of the decision is not yet available, it is known that the ruling of the court establishes the validity of the claim of the corporation against the shipowners, referring the action to another English court.

It will be recalled that when ocean charters became so valuable the owners of the steamships under contract to the Dominion Steel Corporation took the stand that the declaration of war canceled the charters for their vessels and withdrew them to more lucrative trade, in which they have been engaged for several years. The moneys received from the Admira tlea yrETAOINSHRDLSH the Admiralty are far in excess of those which would have been received from the Canadian company and it would seem that the latter has a good claim on this margin. The Steel Corporation also claims heavy damages for failure to carry out the original charters.

Definite action against the owners of the vessels was instituted during the recent visit of Mark Workman, president of the corporation, to England.

ARE INTERESTED IN THE ELECTRIC FURNACE

Organization Formed for Purpose of Spreading Information Bearing on This Point

Steps were taken to promote the use of various electric furnace products at a meeting called by Acheson Smith, vice-president and general manager of the Acheson Graphite Company, held at Niagara Falls on March 21 and 22.

The meeting passed resolutions inviting all manfacturers of electric furnaces, electrical apparatus and electric furnace supplies and accessories, public utility corporations, designers and inventors of electric furnace equipment and the users of electric furnaces to become members and to join in a campaign to disseminate to engineers and to the public data as to the quality of electric furnace products of all kinds.

The organization formed is to be called the Electric Furnace Association. A permanent organization was created as follows:

President — Acheson Smith, Acheson Graphite Company, Niagara Falls, N.Y.

First vice-president—C. H. Booth, Booth-Hall Company, Chicago.

Second vice-president—W. E. Moore, Pittsburgh Electric Furnace Company, Pittsburgh, Pa.

Secretary—C. G. Schluederberg, Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa.

Treasurer—F. J. Ryan, American Metallurgical Corporation, Philadelphia.

Directors—The officers and C. A. Winder, General Electric Company, Schenectady, and F. J. Tone, Carborundum Company, Niagara Falls.

The president was authorized to get in touch with all who should be interested in joining the organization and was requested to arrange an early meeting when completed publicity plans could be presented. In the meantime different committees were instructed to perfect reports as a basis for constructive work.

MARINE

Montreal.—Among shipping on the St. Lawrence this season there will be many vessels of the United States Shipping Board Emergency Fleet Corporation. Within a fortnight after the opening of navigation there will be a fleet of 98 ships coming down from the Great Lakes. Altogether there will be 300 ships completed this summer, which will come down from such ports as Duluth, South Chicago, Saginaw, Detroit, Toledo, Cleveland, Manitowoc, Lorain, and Buffalo.

Toronto.—The board of control received a letter from A. C. McMaster, secretary of the Dominion Shipbuilding Company, stating that the Government had decided against granting any contracts to the company for ships. Contracts for two ships were wanted and very large financing had been arranged in the country. "They have as much right to take up the shipbuilding as these old debt-ridden junk railways," said Con. McBride of the Government. Mayor Church was authorized to again take up the matter with the Government, Board of Trade and Harbor Commission.

Toronto. The navigation season of 1919 is now officially open between Toronto and Hamilton and Toronto and Port Dalhousie. It will be a month, however, before the Canada Steamships Company will open the season between Toronto, Niagara and Lewiston. Ferry service between the city and island is on now. Operations in harbor improvements will start in the near future, and it is proposed to complete what is known as sections 3, 4 and 5 inside the Western gap. The entire breakwater will be built in 1,000-foot sections, with 40-foot intervals, and will serve as a sheltered waterway for small craft as well as preserve the new shore line.

Toronto.—The "War Toronto," one of the fleet of forty-six wooden war freighters being built at different points in Canada, steamed out into the lake on her trial trip. It is just seven months since the freighter was launched, and it is expected that she will be on her way to England before long to take part in coastwise trade. She was built by the Toronto Shipbuilding Company, and her successful trial closes the "war boat" programme of that company. She is a 3,000-ton boat, built to the maximum canal size of 260 feet length and 42-breadth beam. Like her sister boat, "War Ontario," she has proved in every way satisfactory to her builders. She was built on exactly the same lines as the "War Ontario," and as the letter boat has proved seaworthy in bad gales the "War Toronto" will easily make the trip to England.

BOOK REVIEWS

Iron and Steel, by H. P. Tieman, the McGraw, Hill Book Co., New York. Price $4.00.

This is the second edition of this handbook on iron and steel nomenclature and processes and the subject matter has been greatly enlarged, revised and entirely reset. The number of terms and the text also has been entirely reset. The general processes of manufacture have undergone but little change, the principal development being in the greatly increased use of the electric furnace. The chief increase in the text is due to more extended discussions of subjects, such as heat treatment, physical properties, and testing, and to the numerous investigations of the more theoretical aspects of the subject, particularly those included under metallography.

For the benefit of those little versed in the metallography of iron and steel and who may desire a guide to a more sequential, and hence, logical study, than is afforded by the alphabetical arrangement of the text, which has been adopted as best for ready reference, a brief outline of the metallurgy of iron and steel has been prepared, and placed immediately preceding the text.

As has been mentioned, an alphabetical arrangement has been chosen in arranging the text, and the subjects treated of are cross-indexed throughout in such a manner that references are easily found. The subject of nomenclature has been very fully dealt with and the metallographist and mill man are enabled to meet on common ground and understand the technical terms special to each branch of the science, the laboratory and the mill.

The general treatment is a combination of dictionary, an encyclopaedia and a handbook, possessing as well as omitting some of the features of all. The definitions of isolated terms or processes are found under their respective headings, while those employed in connection with some special subject or process are found under the latter, reference being made by page numbers.

This work is of value to the millman metallographist, teacher or student interested in iron or steel.

INDUSTRIAL NEWS

NEW SHOPS, TENDERS AND CONTRACTS PERSONAL AND TRADE NOTES

ENGINEERING

Toronto.—The executive committee of the Toronto branch of the Engineering Institute of Canada has appointed three sub-committees. The first is to consider the ways and means of finding employment for disengaged engineers and for the advancement of others who are seeking the same. This committee had elected E. T. Wilkie as chairman and W. Cross as secretary. The second sub-committee was appointed to consider the feasibility of drafting a scale of fees for services rendered by engineers. This committee is presided over by Frank Barber and the secretary is W. S. Harvey. The third committee is considering the problem of grading the salaries of engineers according to their responsibilities and duties of office.

London.—One of the navy's secrets that has been disclosed since the cessation of hostilities is the use made of otters or Paravanes (called P.V.'s for short) in enabling ships to pass through minefields with almost complete immunity. These devices were towed in pairs, one on either side, from a point as low down as possible on the ship's bows, in such a way that they were not in the ship's wake but stood out obliquely away from the hull. When a mine-mooring cable was encountered it was forcibly deflected from the ship and along the whole length of the towing rope until it came to the Paravane itself. Here it encountered scissors or shear blades which, although it was made of steel 1½ in. diameter, cut it as easily as a pair of scissors cuts a piece of string. These blades, which were only 10½ in. long, with a section about 1½ in. wide by ½ in. thick, had to be made of exceedingly fine and strong steel, and after long and extensive tests by the Admiralty, the "Triumph Superb" high-speed steel, manufactured by Messrs. J. J. Saville and Company (Limited), of Sheffield, was exclusively adopted for them. The whole efficacy of the Paravanes, so far as mines were concerned, depended on these cutter-blades, for if through becoming blunt or breaking they failed to cut the cable, the mine would remain submerged and dangerous, whereas if it was released and rose to the surface it could be immediately detected and destroyed. When one realizes that the size of cable anchoring the German mines was 1½ inches in diameter, the efficiency of the Paravanes was most astonishing. As the secret of these steels is released commerce will be immensely benefited in their application.

PERSONAL

J. B. O. Kemp has been appointed manager of the Toronto Branch, at 208 Kent Bldg., of the Herbert Morris Crane & Hoist Company, Limited.

H. W. Appleton, formerly with Robert W. Hunt & Company, and recently works manager Toronto Plate Glass Importing Co., has joined the staff of Burns & Roberts, Ltd., railway and contractors' equipment, Toronto.

H. E. Streeter, who has represented the Swedish Gage Co. in Canada for the past seven or eight years, is resigning from the company. The Montreal office will be closed and a new office will be opened in Toronto, and will be in charge of M. J. Horsey, late of the Imperial Munitions Board.

Major Jas. McGregor, resident engineer of the Halifax ocean terminals, has arrived back after two years' service in the Third Battalion of Canadian railway troops. Major McGregor was engaged, while in France, in building and repairing standard gauge roads destroyed by the Germans.

F. D. Still, vice-president and secretary of the Canadian Sirocco Company, has left on an extended trip for the far East, where he will investigate trade conditions in connection with export work. Mr. Still's itinerary includes Japan, China, Australia and most of the European countries and he expects to cover approximately 36,000 miles before returning home about November 1st.

C. S. Ogilvie has been appointed to the position of assistant engineer for the Ottawa division of the G. T. R. System. Mr. Ogilvie held a similar position with the same company at Belleville, but resigned to go overseas. He was a prisoner in Germany for over three years, being released after the signing of the armistice.

Stratford Wins.—The first aid team of the transportation department of the Stratford shops was again successful in taking the first honors in the annual competition held last week by the G.T.R. at Montreal. The Chamberlain shield is the prize awarded for efficiency in this work. The executive of the Grand Trunk System take a keen interest in encouraging first aid work in all their large shops and terminals.

TRADE GOSSIP

New Office Opened.—Forest, Jackson and Forest are opening up an office in the old Witness building on Craig St., Montreal, for the purpose of carrying on a general brokerage business in steels, metals and machinery.

Action Decided.—The Montreal Cotton and Wool Waste Company has been awarded judgment to the amount of $17,-167 against the Dominion Iron and Wrecking Co. The action arose over the refusal of the defendant to pay the purchase money required to buy the material in a bridge at Grand 'Mere.

A Coal Strike.—T. J. Freeman, manager of the St. George's coal field, Sydney, N.S., received a message from the company's expert to the effect that after tunnelling south for 200 feet at a depth of 140 feet a solid six-foot seam of coal had been struck. This is splendid news to the shareholders of the company, as the best seams in Cape Breton do not exceed six feet.

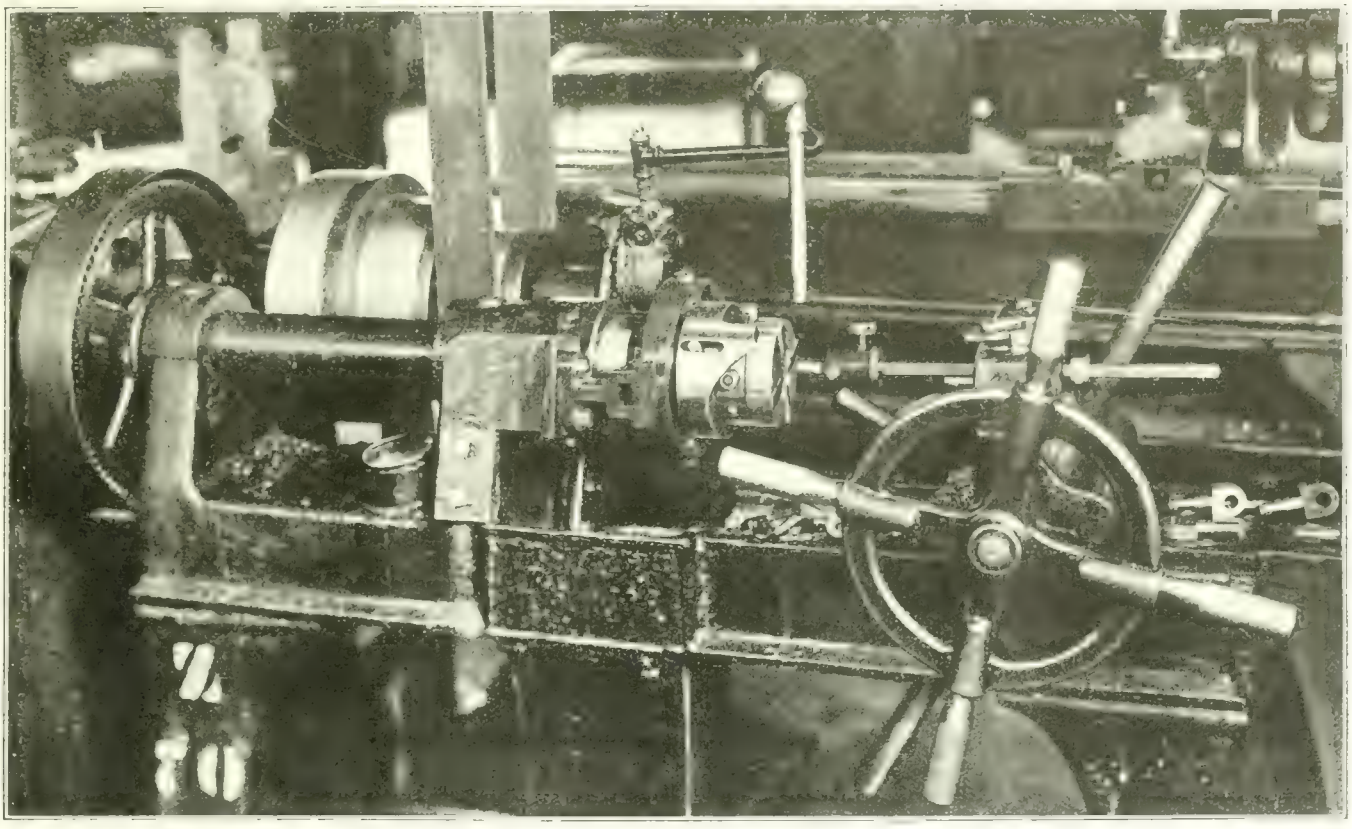
Agricultural Machinery.—A firm at Nova-Nikolaevsk, Siberia, with several years' experience in the agricultural machinery and engineering trades of that country, is desirous of securing the representation of Canadian firms in a position to supply machinery and other lines suitable for the Siberian market. If interested write Commercial Intelligence Branch, Dept. of Trade and Commerce, Ottawa, and mention reference 663.

Open New Offices. — The Wallace Barnes Company of Bristol, Connecticut, manufacturers of springs of every description, screw machine products, and high carbon cold rolled steel, has opened up branch sales offices at 50 East 42nd St., New York City, and 618 Book Building, Detroit, Mich., these offices being under the charge of District Sales Managers Lisle K. Lasher, and Brown Joyce, respectively.

Fatal Explosion.—A fatal explosion took place last Saturday on one of the boats of the Dominion Coal Company, when the bottom blew out of one of the combustion chambers of one of the boilers, resulting in the death of five of the crew, Chief Engineer C. R. McArthur, Second Engineer W. Scott, K. McDonald and two Chinese firemen, and likewise injuring the third engineer, M. Campbell, and two Chinamen

That Peterboro Bridge.—The controversy of steel vs. concrete for the construction of the Hunter St. bridge continues. The last move has been the sending in of plans for a steel bridge by Toronto engineers the structure to be 810 feet long with a fill-in at each end. Steel was practically unobtainable when the proposition was first considered, and

BROUGHT UP TO DATE



This old Bolt Cutter has been turned into an up-to-date Threading Machine by the application of a Geometric Die Head.

The Connecticut Telephone Company removed from this Bolt Cutter the solid die head with which it was equipped, and put in its place a Geometric Self-opening Die Head of the type regularly furnished on the Geometric Threading Machine.

Thread is 7-16" diameter, 14 U.S.S., about 1" long, on switchboard terminals of a high class copper casting.

The best part of it is, that besides getting clean, sharp threads, they have increased the work about six times over what was being accomplished with a solid die head.

Has any threading operation been given the right chance unless a Geometric figures in it?

The Geometric Tool Company, New Haven, Conn., U.S.A.

CANADIAN AGENTS:

Williams & Wilson, Ltd., Montreal
The A. R. Williams Machinery Co., Ltd., Toronto, Winnipeg, St. John, N.B.

for that reason the reinforced concrete design was most favored.

New Brantford Concern.—Incorporation papers have been granted to Bayard Geekie Cobb, of the City of New York, engineer; W. J. Aikens, Dunnville, manufacturer; J. B. Detwiler, manufacturer; Thomas Hendry, insurance broker, and W. T. Henderson, King's Counsel, all of the City of Brantford, to acquire, erect, construct and operate furnaces for smelting and reduction of ores, metals and minerals, etc. The firm will operate under the name of "Electro Tin Products, Limited." Capital is $300,000, and head office and works at Brantford, Ont.

New Concern Incorporated.—Incorporation has been granted to the International Machinery and Supply Co., Ltd., Montreal, as a private company, to act as importers, exporters, and to buy, sell and otherwise deal in all kinds of goods, wares, merchandise and commodities. To manufacture and deal in iron, steel, and other metals from the ore to the finished product thereof, and all goods, wares, plant, machinery and merchandise in which iron, steel or any other metal may be used in whole or in part, etc. The capital is placed at $100,000, and Montreal is named as the chief place of business.

Putting in Machines.—Lyons & Co., of Parry Sound, are installing new machines to take care of their growing business. They are installing one or two more automatics for the manufacture of pill boxes, which this firm specialize in. This work was practically all done in the United States formerly, and this local firm are corralling the bulk of this business, going in exclusively for pill boxes, and making a success of it at that. An enlargement of the premises is contemplated shortly.

Repairs to Canal.—The Lachine Canal is now empty for the annual spring cleaning and repairs. Owing to the heavy traffic of last year considerable repairing has been necessary, but owing to the short time at the disposal of the commissioners, due to the early opening of navigation, the work will require to be hurried, and much will require to remain undone for another year. The free movement of the ice this year has prevented any serious jamming, and lock gates and bridges are consequently in good condition. It is expected that the water will be admitted about the 15th.

Change in Time.—In an effort to reduce operating expenditure, and at the same time retain its full quota of employees, the Point St. Charles shops of the Grand Trunk has been reduced to a working week of 40 hours. This action was taken after considerable deliberation, as it was felt that it was better to reduce the time for all the men than to lay off a portion and increase the number of unemployed. Mr. Sample, the superintendent of motive power, has intimated that the change will be a permanent one.

Making Water Meters.—The Neptune Company of New York, the largest manufacturers of water meters in the world, have decided to locate a branch manufacturing plant in Canada. They will be incorporated under the name of The Neptune Meter Company, Limited, of Canada. They have obtained floor space on the corner of King and Dufferin streets, in the former munition factory of the Russell Motor Company, and will, just as soon as it is practicable, equip a factory for the manufacture of water meters for the Canadian trade. The parent company has done a very large business in Canada during the past ten years, and will now be in a position to render very prompt service in the way of supplying repair parts, etc.

Adjusting Claims.—Adjustment of claims with respect to unfinished contracts entered into by Canadian manufacturers with the United States Government is being proceeded with by the Imperial Munitions Board as rapidly as circumstances will permit. The Board, together with two American officers identified with it as assessors, are considering claims, and settlements are being arrived at. Altogether there are

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Cloth; new and second-hand clothing, equipment, hardware, tents, blankets, camp supplies, etc. :: Flour, jam, canned evaporated milk, tea, coffee, etc. :: Condemned clothing, junk, old brass, metals, leather, rubber, etc.

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Persons desiring to tender are requested to communicate with **THE SECRETARY OF THE WAR PURCHASING COMMISSION, BOOTH BUILDING, OTTAWA,** stating the items in which they are interested, whether new or second-hand or both.

Arrangements will be made to have samples on exhibition at places throughout Canada; specifications, full details, and tender forms will be mailed when ready to those who have registered as suggested above.

IF INTERESTED PLEASE APPLY NOW

Institutions May Make Direct Purchase Without Tender

Dominion, Provincial and Municipal departments, hospitals, charitable, philanthropic, and similar institutions which are conducted for the benefit of the public and not for profit may purchase goods without tender at prices established by the War Purchasing Commission.

All communications should be addressed to the Secretary, War Purchasing Commission, Booth Building, Ottawa, who will be glad to supply lists and further details to those interested.

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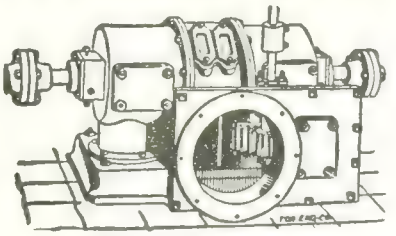

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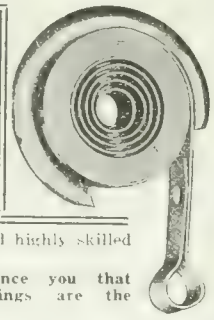
are unusual in service and wear.



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Machine Tools for Iron & Steel Works.

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We do any kind of sheet metal stamping that you require. Our improved presses and plating plant enable us to produce the finest quality of work in a surprisingly short time.

We can finish steel stamping in Nickel, Brass or Copper.

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about 330 contracts that are being dealt with. The American contracts constitute the great bulk of the claims that are still outstanding. Between 95 and 97 per cent. of the British contracts have been considered, and settlements have been made, and it is expected that the Munitions Board will be able to complete the adjustment of these British orders within the next few weeks.

Can Take Action.—Formal permission was received from Official Referee J. A. C. Cameron by J. M. Bullen, acting for the Toronto Harbor Commissioners and for B. Heinstein & Sons, of Christiansand, authorizing him to proceed in actions against the Polson Iron Works to recover extensive damages. The Harbor Commission sue to recover possession of part of Frederick street and water lots which the Polson Iron Works allege they hold, not on the sufferance of the Commissioners, but pursuant to an agreement for a lease with the city. They also ask $60,000 for mesne profits and for use and occupation. Heinstein & Sons sue for the return of $41,500 which they allege they overpaid for the steamer Asp, built by the Polson Iron Works. They also ask for $200 a day from August 11, 1917, upon which rate the boat was to have been completed, but was not completed until October last. The damages claimed by them total $74,600.

Australian Trade. — Two representatives of an important Australian company will shortly arrive in Canada with a view to interviewing Canadian manufacturers who may be able to supply articles required in Australia. The following lines are of particular interest to this firm: Galvanized black and steam tube, bar iron, steel boiler plates, rivets, bolts and nuts, galvanized corrugated iron, black steel sheets, aluminiumware, enamelware and engineers' requisites in general. They are engineers and contractors in a very large way of business, with warehouses under most capable management at Melbourne, Sydney, Brisbane, Adelaide and Perth. They do a very extensive trade generally, besides being successful contractors to various Commonwealth and State purchasing departments. If interested in this communicate with Commercial Intelligence Branch of the Department of Trade and Commerce, Ottawa, and mention reference number 627.

Open Montreal Office.—The Canadian Link-Belt Co. have opened a branch at 1195 St. James St., Montreal. A liberal stock of popular types of Link-Belt will be carried in stock at Montreal in the future from which all orders in that section will be promptly filled. This will not only enable the Canadian Link-Belt Company to render its customers a more prompt service than has hitherto been possible, but will also effect for them a considerable saving in freight and express. For the present the Montreal branch will serve largely as a warehouse, all engineering assistance being rendered by the Canadian Link-Belt Company at Toronto, where Link-Belt is manufactured for the Canadian market. Although shipments for the Montreal and Quebec territory will be shipped from

the Montreal branch all correspondence should continue to be addressed to the Canadian Link-Belt Company, Toronto

Munition Shops Converted.—A number of big firms in the United Kingdom are engaged in making preparations for competition with America. The work of dismantling tools, clearing away obsolete machinery and standardizing parts for mass production is well under way. Hundreds of additional acres are to be covered with workshops, and big National munition factories offered for sale by the Government are being purchased for the installation of the additional plant required. One firm is aiming at an output of 20,000 cars per annum. Another has just paid £140,000 for one of the National Aircraft Engine Factories, which cost the "Old Country" £133,000 to build. It is expected that five thousand workers will be employed in this concern, which will turn out fast pleasure cars, and heavy transport vehicles. The cars will be British built throughout, and will be fitted with British magnetos. The entire factory will be organized on the lines of quantity production from standard jigs. There are another fourteen factories in various parts of the country belonging to the nation which are available for private enterprise.

Restrictions Removed.—Advices have been received by G. T. Milne, Montreal, and F. W. Field, Toronto, British Trade Commissioners in Canada, that the following additions have been made to the list of goods which may be exported without license: Fancy goods made of morocco and light leathers; iron and steel manufactures generally except high speed steel and certain special articles; machinery of all kinds except textile machinery and machinery wholly made of brass or copper; toys and dolls; games of all kinds. Lists of export restrictions recently removed: Binder twine, barrels and casks, boilers, chrome ore, chestnut extract cork, fuel economizers for boilers, 'goldbeaters' skin, glue stock, dry white lead, hide clippings resins, lead coated sheets, paraffin, wax, pigskins, cast iron pipes, or steel wire, wire rope, quebracho extract, cast iron radiators, solid glucose, railway sleepers of iron or steel, railway springs, railway wheels, axles and tyres, railway constructional material except rails, silk manufactures, spirits except whiskey, terneplates, tinplates. Important prohibition relaxed: Bacon, lard, hams, hardwood, the latter until January 1st. Important relaxations revoked, licenses will be now necessary for brooms, brushes, buttons, gloves of leather and fabric, gas mantles, vegetable, tape, cotton piece goods.

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16" Slotting Machine with quick return and balanced ram, by Loudon Bros.

30' Plate Edge Planer, belt driven. Makers, Shanks & Co.

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In excellent condition.

Automatic and Hand Screw Machines
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100 ½ and 1 ¼ h.p., air cooled gas engines, in semi-finished condition, with patterns, jigs, gauges, etc. Attractive bargain to serious party. Apply to
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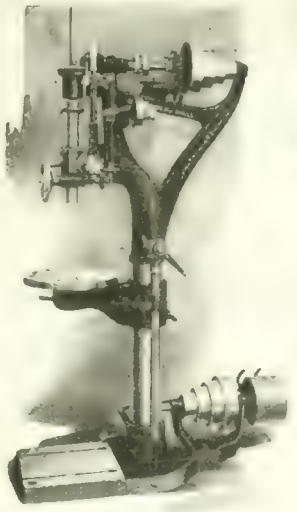

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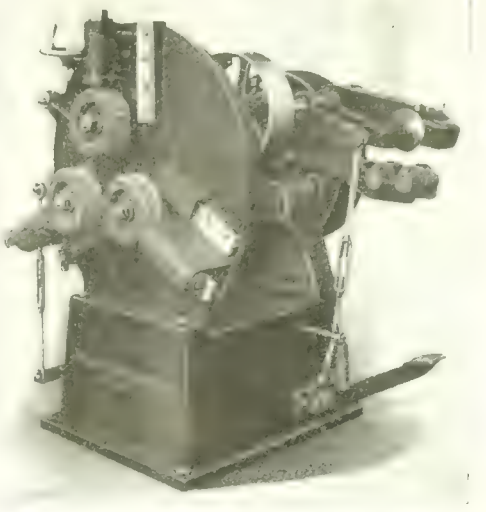

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FRANK E. MUTTON

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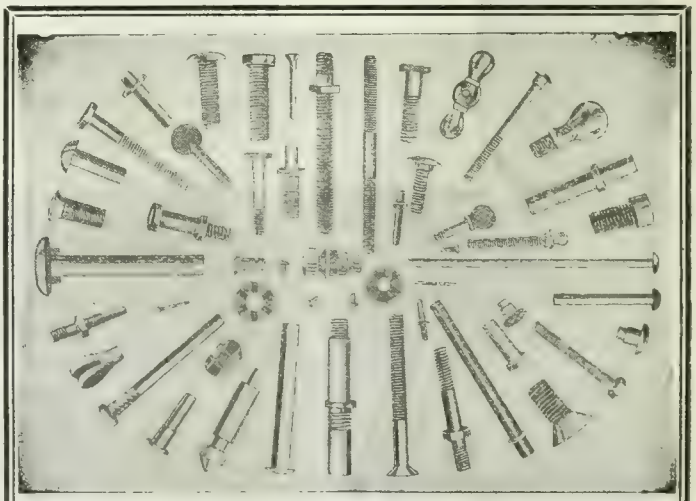

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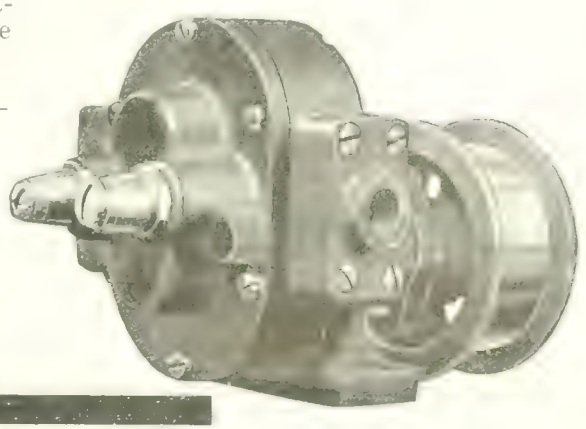

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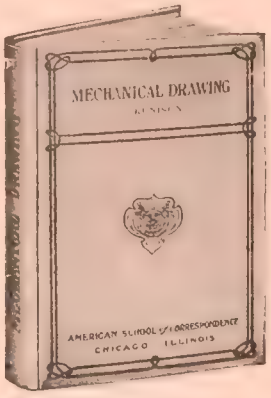

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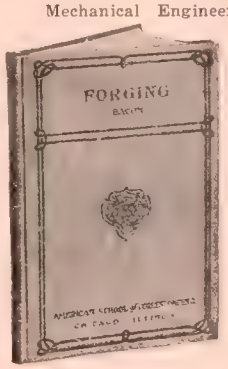

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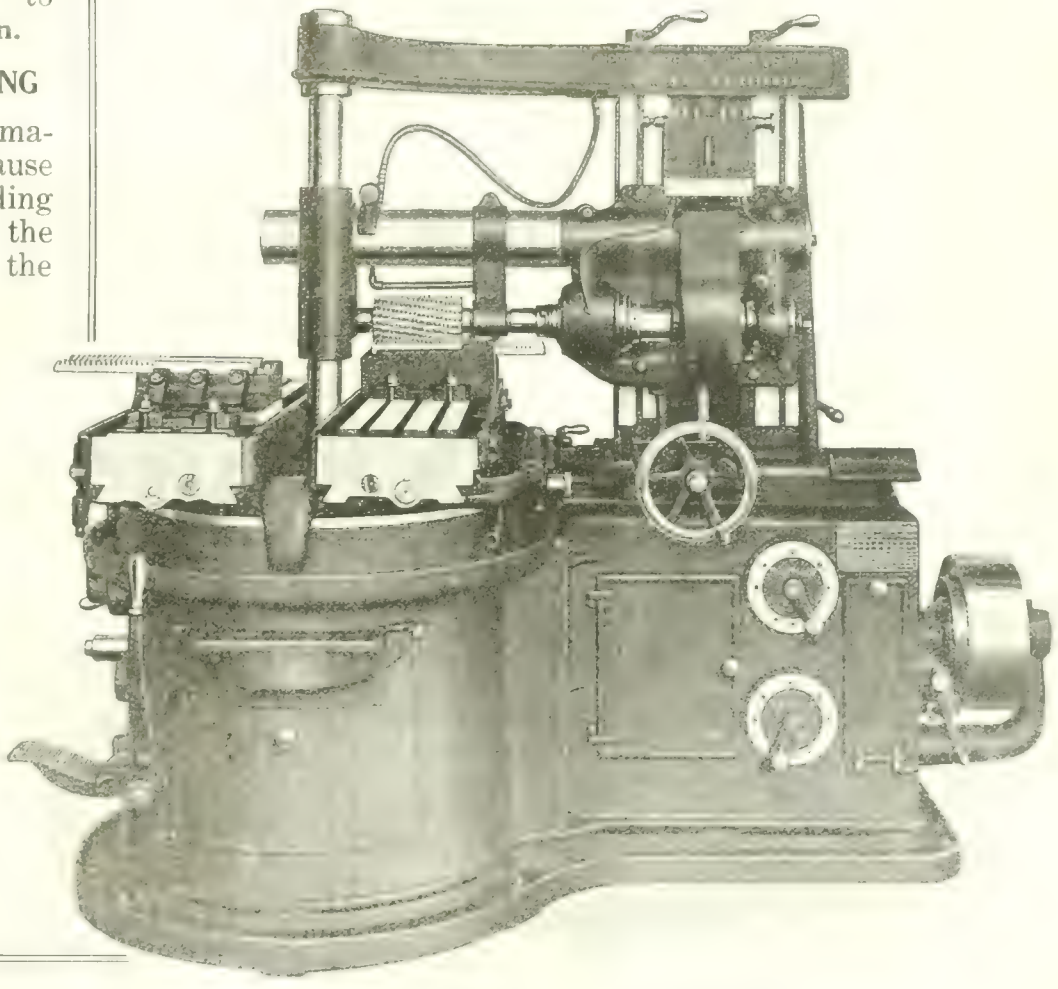

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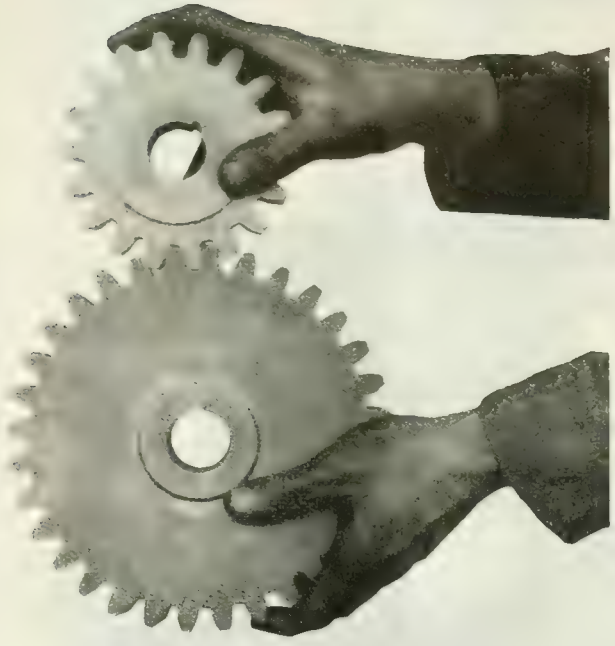

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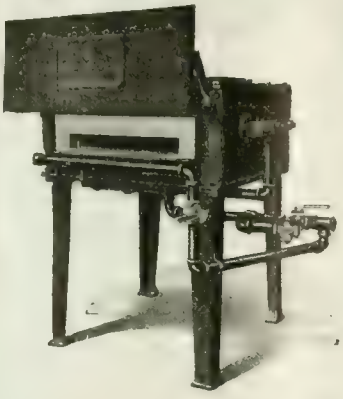

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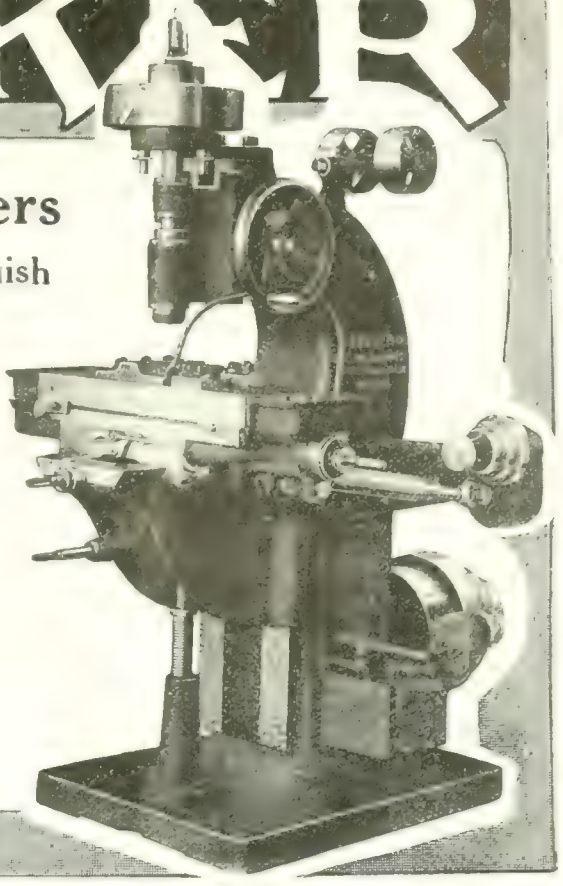

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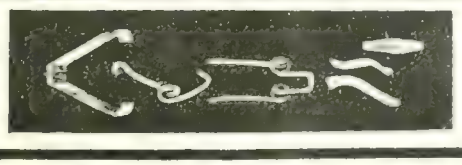

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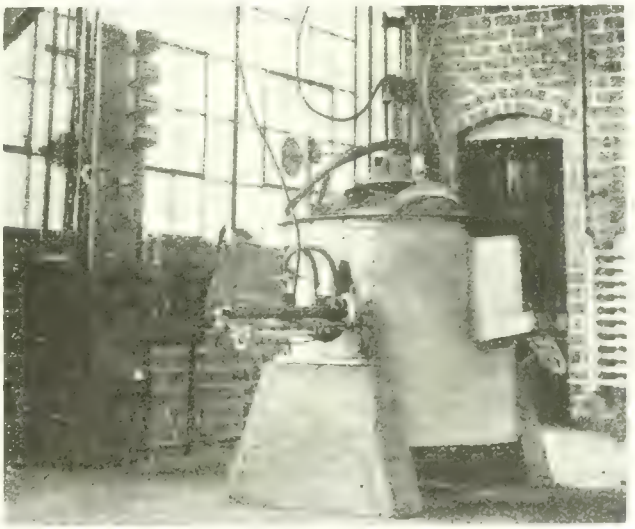

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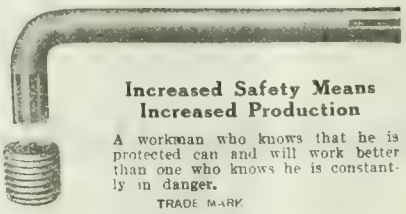

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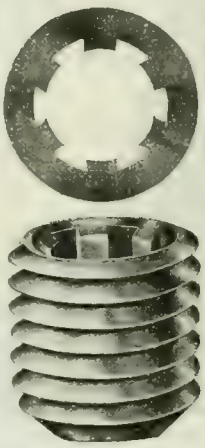

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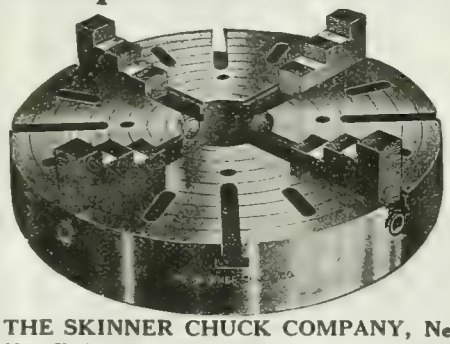

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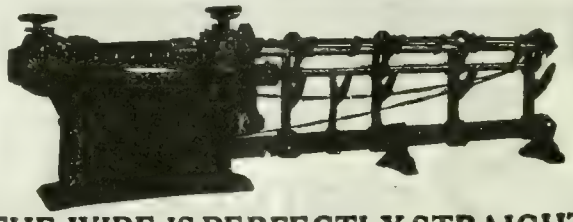

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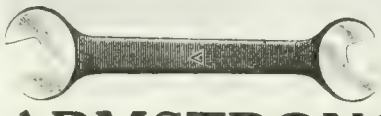

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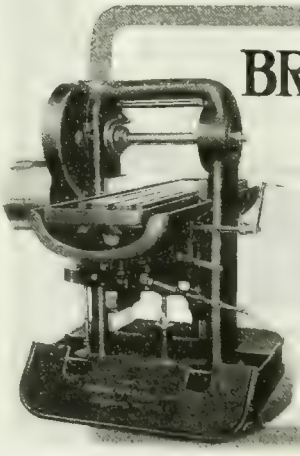

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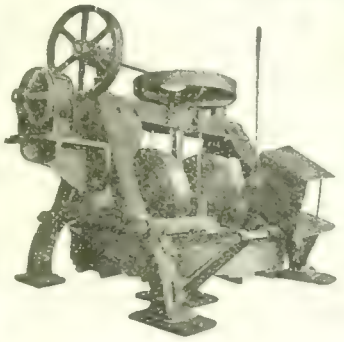

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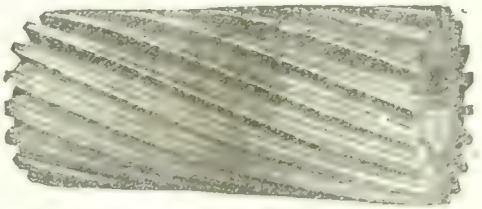

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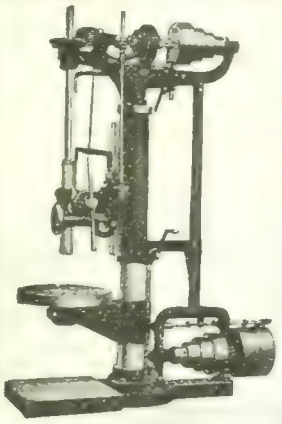

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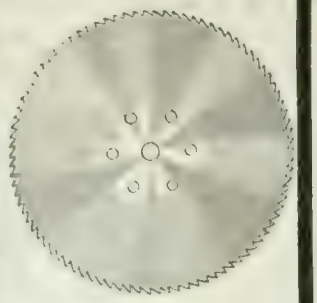

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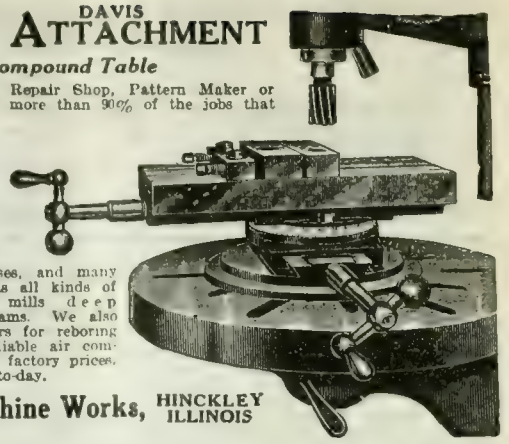

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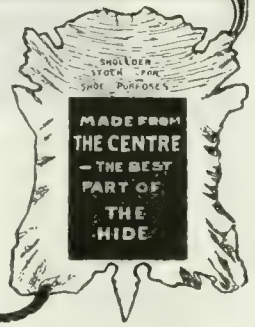

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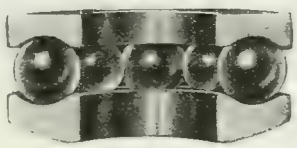

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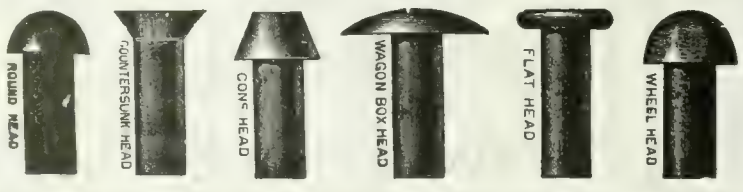

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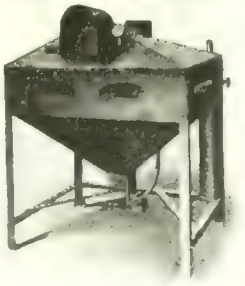

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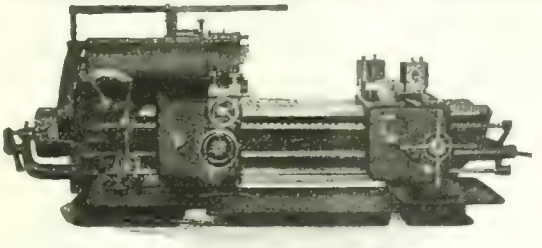

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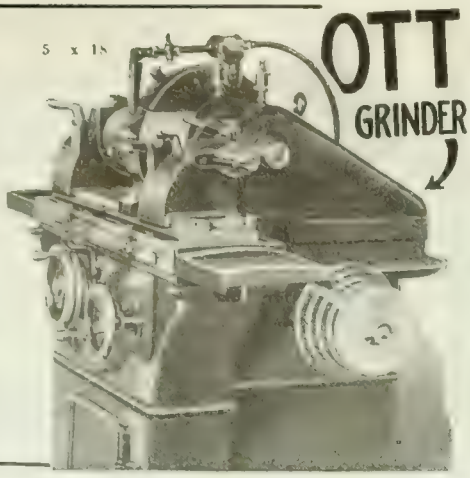

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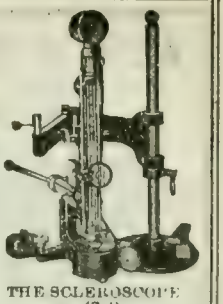

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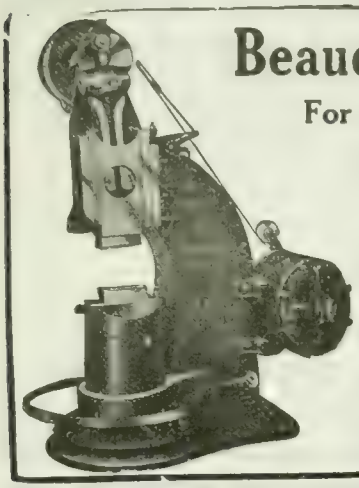

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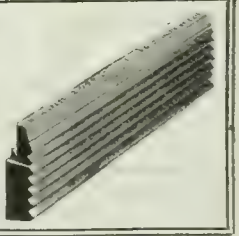

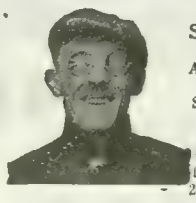

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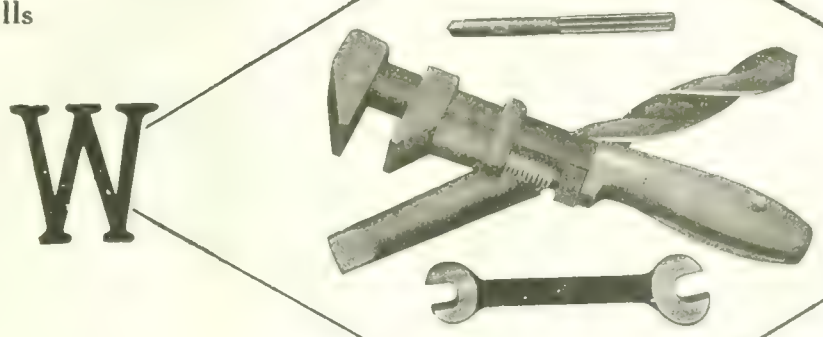

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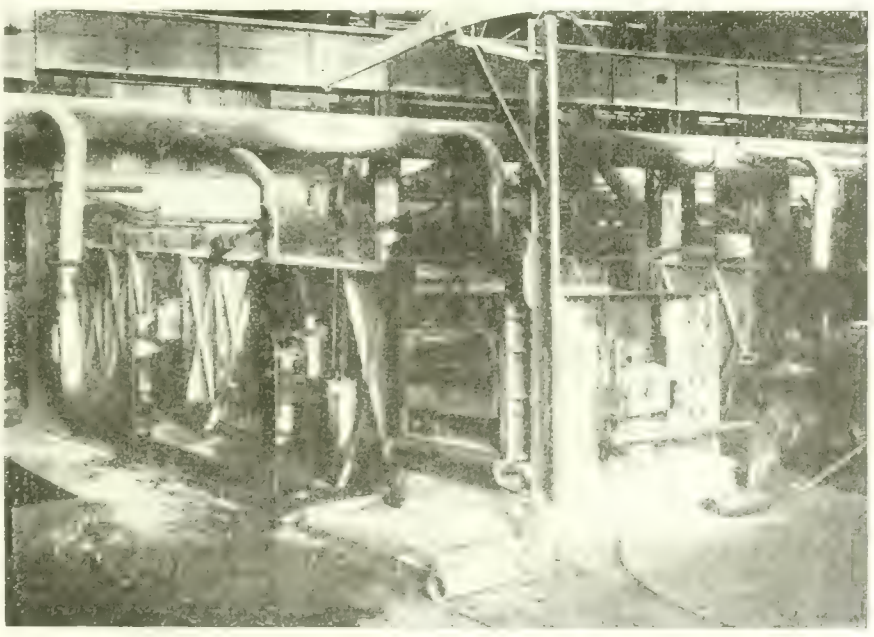

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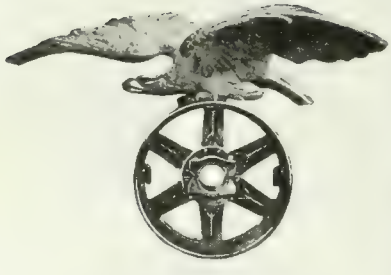

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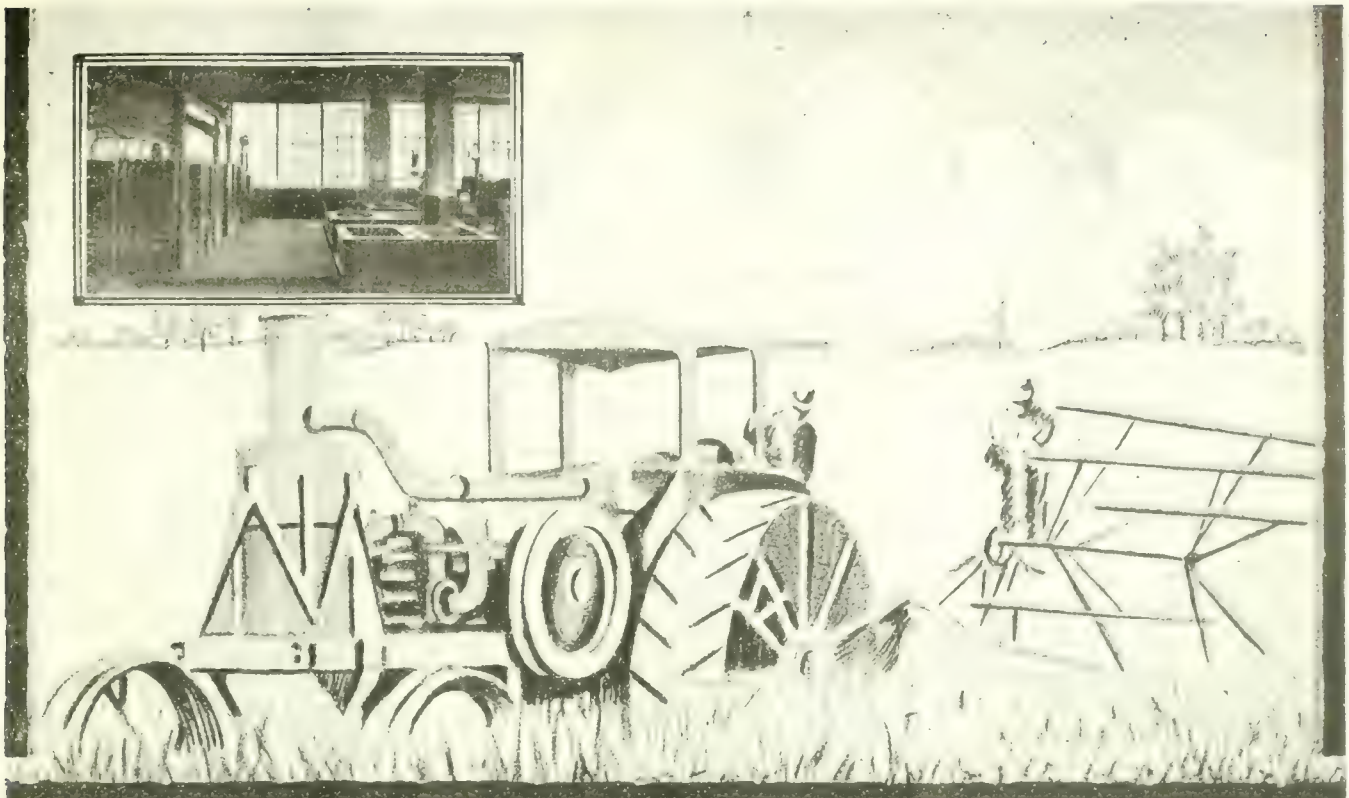

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Wheel Trueing Tool Co., Detroit.

DIAMONDS, BLACK AND ROUGH
Joyce, Koebel & Co., Inc., New York.
Wheel Trueing Tool Co., Windsor, Ont.

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Wells Bros. of Can., Galt, Ont.
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Pittsburgh Steel Stamp Co., Pittsburgh, Pa.

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A. B. Jardine & Co., Ltd., Hespeler, Ont.
Wells Brothers Co. of Canada, Galt, Ont.

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Banfield, W. H., & Son, Toronto.
Boker & Co., Inc., H., Montreal, Que.
Butterfield & Co., Rock Island, Que.
Brown, Boggs Co., Hamilton, Ont.
Canadian Fairbanks-Morse Co., Montreal.
The Geo. F. Foss Mchy & Supply Co., Montreal.
Gardner, Robt., & Son, Montreal.
A. B. Jardine & Co., Hespeler, Ont.
Landis Machine Co., Waynesboro, Pa.
Modern Tool Co., Erie, Pa.
Morse Twist Drill & Mch. Co., New Bedford, Mass.
National Acme Co., Cleveland, Ohio.
Pratt & Whitney Co., Dundas, Ont.
Rice Lewis & Son, Toronto, Ont.
Rickert-Shafer Co., Erie, Pa.
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Butterfield & Co., Rock Island, Que.
Landis Machine Co., Waynesboro, Pa.
Williams & Wilson, Limited, Montreal, Que.

DIES, THREADING
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Wells Bros. of Can., Galt, Ont.

DIE SINKERS
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Garvin Machine Co., New York.
Pratt & Whitney Co., Dundas, Ont.

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Wells Bros. of Can., Galt, Ont.

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Wells Bros. of Can., Galt, Ont.

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Landis Machine Co., Waynesboro, Pa.
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Wells Brothers Co. of Canada, Galt, Ont.
Williams & Wilson, Limited, Montreal, Que.

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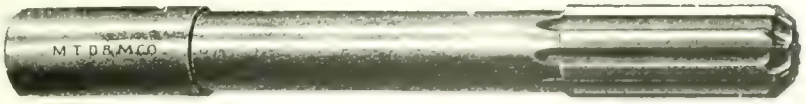

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Canadian Fairbanks-Morse Co., Montreal.
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Cleveland Twist Drill Co., Cleveland.
Garlock-Walker Machinery Co., Toronto, Ont.
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Morse Twist Drill & Mch. Co., New Bedford, Mass.
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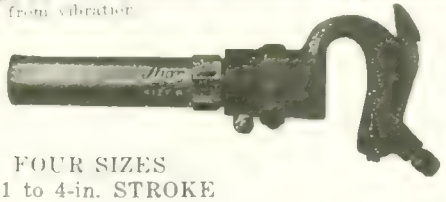
Thor [illegible]

1st. The main valve is large in size and [illegible] having a bearing surface at three square inches.

2nd. Two [illegible] as no air passes over to blow the oil off.

3rd. The handle is equipped with a self-seating throttle valve, which eliminates all leaks.

4th. The barrel and [illegible] is practically free from vibration.



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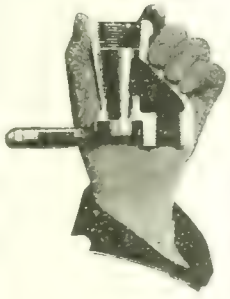
Valves, Couplings, Clamps, Nipples, Menders, Hose

Everything required from "Pipe Line" to "Air" Tool

All Fittings Furnished are Interchangeable and Air Tight



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The CLECO Air Valve has but three parts: Body, Valve Plug and Handle; no Packing required, has Waste arrangement.

The CLECO Valve, style P.O., is made in sizes ½ inch to 1½ inches, with standard pipe thread. Style F.O. is made in one size only; 1-inch pipe thread inlet and ¾ inch Female Bowes Coupling Outlet and is interchangeable with Male Ends from ¼-inch to ¾-inch.

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The Hose Section illustrated shows "Y" Fitting connected. The "Y" permits use of two Leader Hose Lines and Two Air Tools. Designed for Ship Yards use. Are made in four styles with Male or Female Outlets or Inlets and interchange with Bowes Male or Female coupling ends; sizes ¼-inch to ¾-inch inclusive. The two "Y" fittings illustrated are the plain style. The other two styles are each equipped with a valve having same features as Cleco Air Valves described above.

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BOWES AIR HOSE COUPLINGS

Over 2,500,000 in general use.

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The Bowes is absolutely Air Tight under all pressures.

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Canada Foundries & Forgings, Ltd., Welland, Ont.
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FRICTION SURFACE BELTING
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★ **Stefansson's story will be published exclusively in Canada in MACLEAN'S. The series of articles by him, now appearing in American and Canadian newspapers, refer entirely to his experiences on previous explorations and do not deal with the journey that he undertook for the Dominion of Canada and completed last year.**

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"Imperial Relations Must be Worked Out," by Viscount Bryce. An important announcement on the future construction of the British Empire.

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"Bombing the Boche," by Lieut. J. Vernon Mackenzie. The second of the two articles that Mr. Mackenzie has written on the whirlwind campaign of raid reprisals which so frightened all Germany.

"The Transformation," by Frederic S. Isham. Illustrated by Hanson Booth. The second instalment of this sparkling new serial.

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The Review of Reviews

The best articles from all publications the world over are selected and condensed for this department. Some of the articles in the April number are:

The Man Behind Bolshevism.
Could German Fleet have been Destroyed.
The Secret Plans of the Allied Command.
Too Much Wilson.
Is the ex-Kaiser Haunted?
Next Government Will be Labor.
New Life of Deposed Princess.
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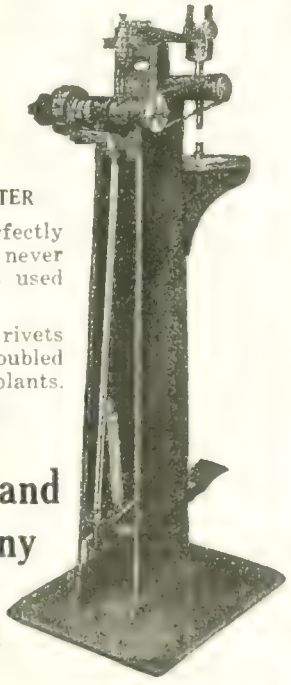

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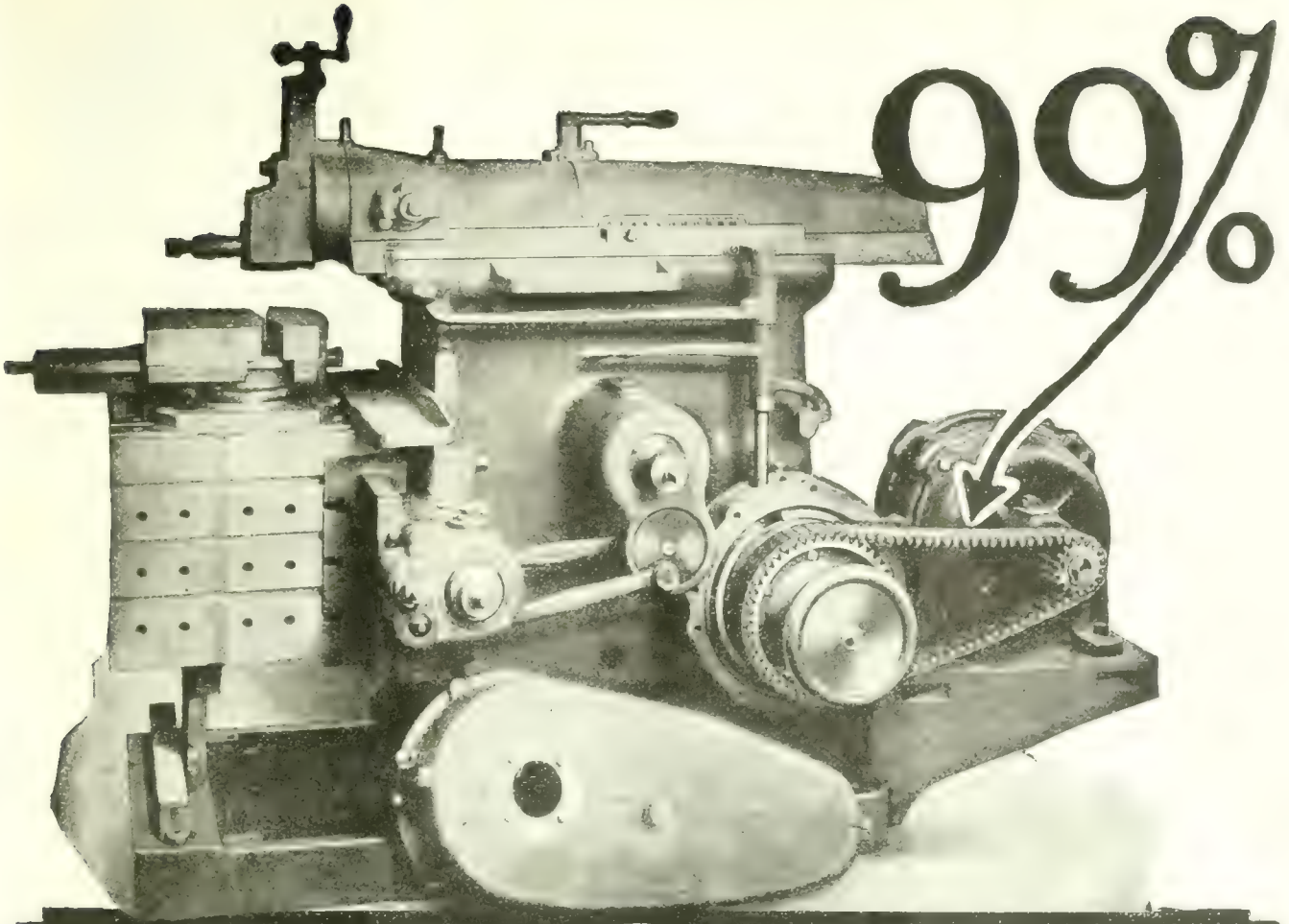

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William R. Perrin, Ltd., Toronto.

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Bertrams, Ltd., Edinburgh, Scotland.
MacKinnon Steel Co., Sherbrooke, Que.

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Fox Machine Co., Jackson, Mich.
Garlock-Walker Machinery Co., Toronto, Ont.
Williams & Wilson, Limited, Montreal, Que.

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Fetherstonhaugh & Co., Ottawa.
Marion & Marion, Montreal.
Ridout & Maybee, Toronto.
Dominion Pattern Works, Toronto, Ont.
J. C. Wilson & Co., Belleville, Ont.
Greenleafs Ltd., Belleville, Ont.
Marten Machine Co., Hamilton, Ont.

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Greenfield Tap & Die Corp., Greenfield, Mass.
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A. B. Jardine & Co., Hespeler, Ont.
Landis Machine Co., Waynesboro, Pa.
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Wells Bros. Co. of Canada, Galt, Ont.
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Greenfield Tap & Die Corp., Greenfield, Mass.
Wells Bros. of Can., Galt, Ont.

REAMERS, EXPANDING
Greenfield Tap & Die Corp., Greenfield, Mass.
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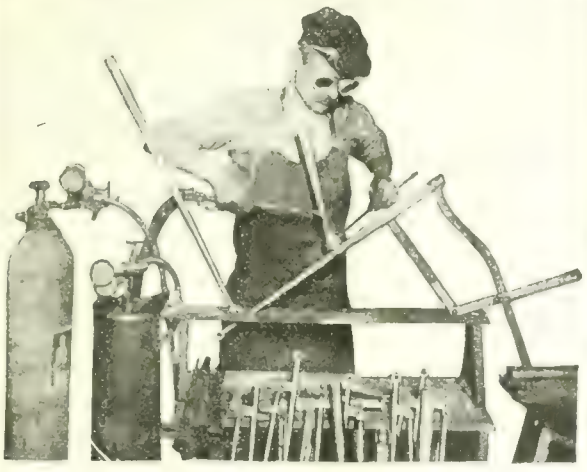

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AN amazing light is thrown on the methods of the Boche in occupied territory during hostilities, by a front-page item in THE FINANCIAL POST of April 5th. Their pillaging of the industrial districts of Belgium and France is explained on the ground that they were just keeping the goods and machinery safe from the British guns. The way they put it in the form of instructions to their commercial agents (now again busily engaged in rebuilding German export trade) is really worth reading. It arouses a smile; it also awakens keen thinking. POST news items have a way of doing that for every alert business reader.

Note, for instance, these contents of the

Financial Post

dated April 5th

Private Companies Win Decisions in Hydro Fight
U.S. Railroads are Ignoring the New Steel Prices
Big Market in Sight for Canada's Paper
Canada's Wheat Problem: Canada's Wheat Wanted
Canada is Now Buying Less in United States
Steel Reduction is Not Resulting in New Business
Crerar Unfair to the Western Land Companies
An Opening for Canada in Irish Linen Industry
Canadians Study British Industry
Trust Company is Formed by Merchants Bank
Amending the Legislation Re Loan Cos.
Labor Commission Will Aid Industry
Canada's Wheat and British Millers
Unbusinesslike Administration of Alberta 'Phones
Deny Newsprint Prices Being Cut
Fairbanks-Morse Shows 44.38 Per Cent. on Common
Weyburn Bank Has Big Balance in Other Banks
Dominion Linens is Operating a Spinning Plant
A. Macdonald, and Relations of the Common
C.P.R.'s Position Was Maintained During Year
Scotia Steel Company Would Mine From Dominion Area
Monarch Knitting Dividend Outlook
A Canadian U.S. Alliance in Bank Field
Experience vs. Training in Banking Field
The Claim of the Banker for More Salary
Business, Sentiment, and the G.T.R. (Editorial)
Finding a Job for the Idle M.P. (Editorial)
Bond Market Lapses Into Dull Condition
Big Bond Issue for an Eastern Pulp Company
Building Costs Not Likely to be Lower.
Alberta's Acts for Relief of Mortgagors
School Houses Are Becoming a Worse Hazard.

Business Building News Items Appear Each Week in *The Financial Post*

The above are only a few of the many subjects of real profit-making interest to Canadian men of affairs which have been dealt with by expert writers and editors in THE POST of April 5th. THE POST will keep you informed on Canadian business matters in a way unrivalled by any other publication. Send for a subscription to-day. The price is $3.00 per year, and you have only to fill in this form:

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TAPS, GUN
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TAPS, HAND
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TAPS, MACHINE RELIEVED
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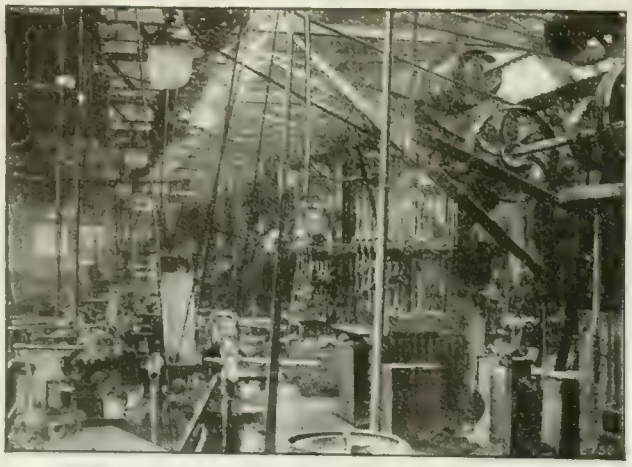

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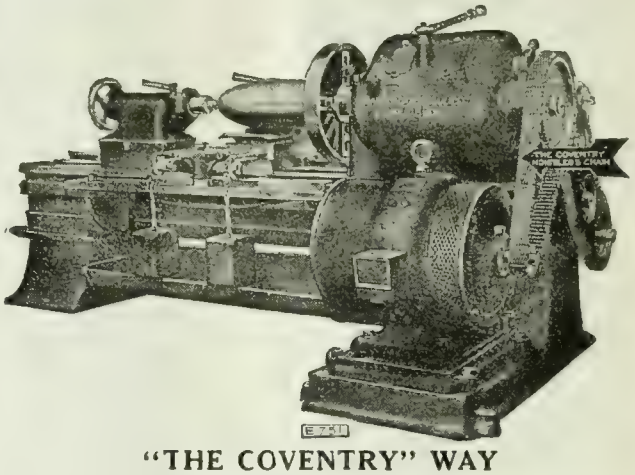
Notice the space occupied by belts, pulleys and shafting, which darken the workshop and throw shadows on the work.



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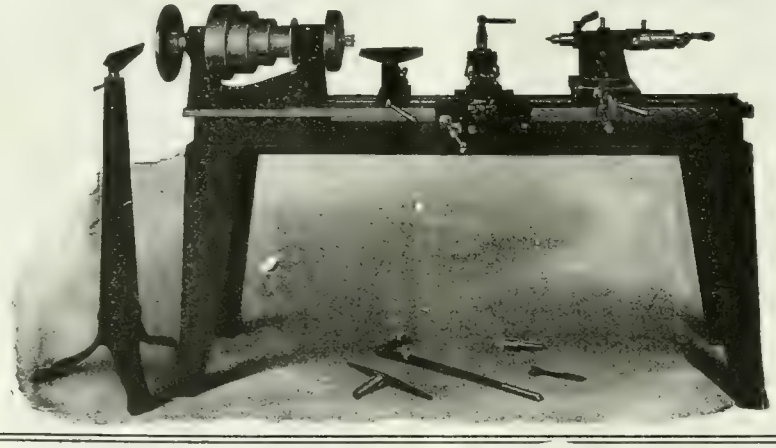

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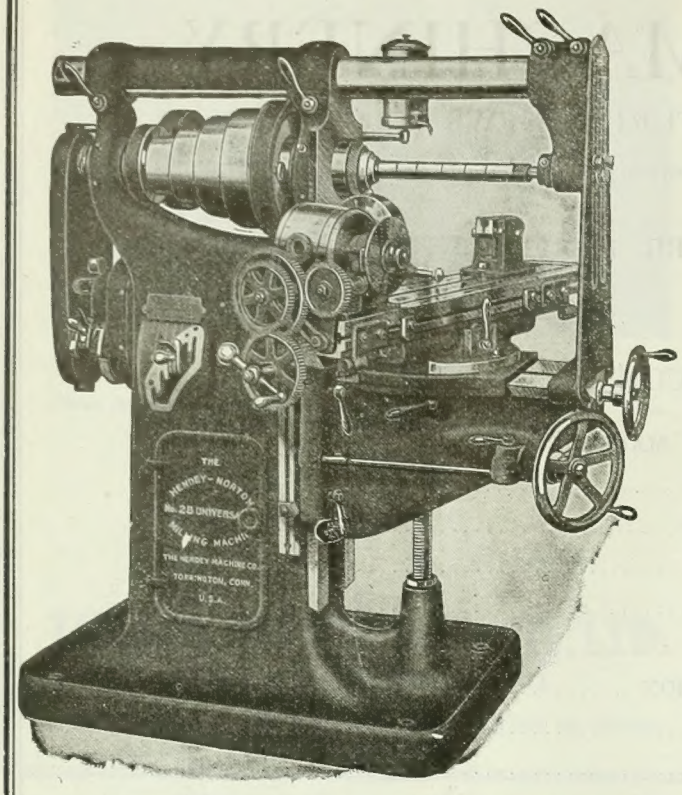

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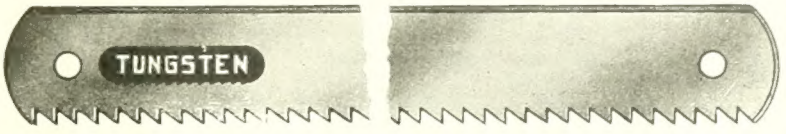

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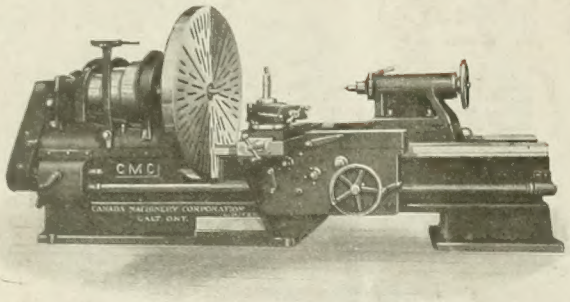

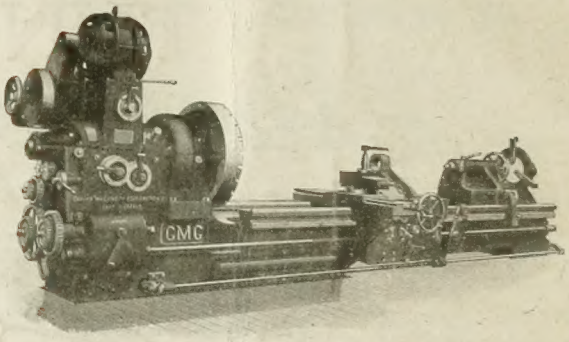

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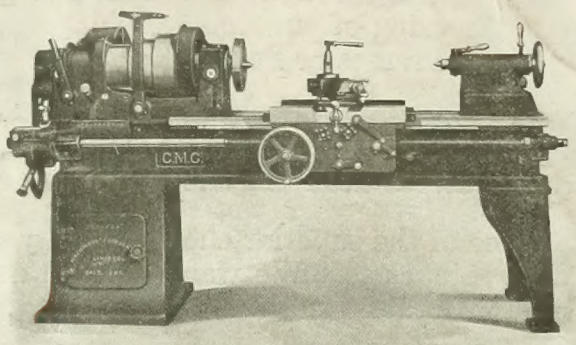

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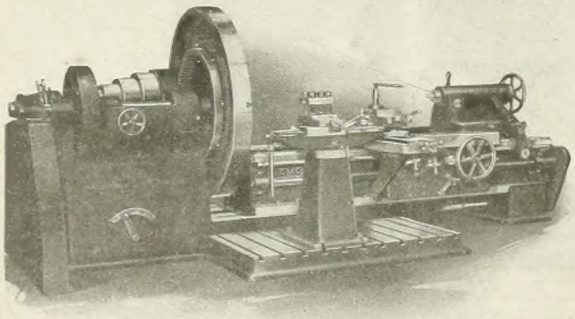

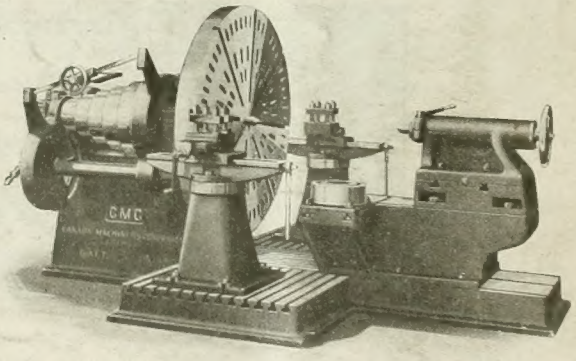

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